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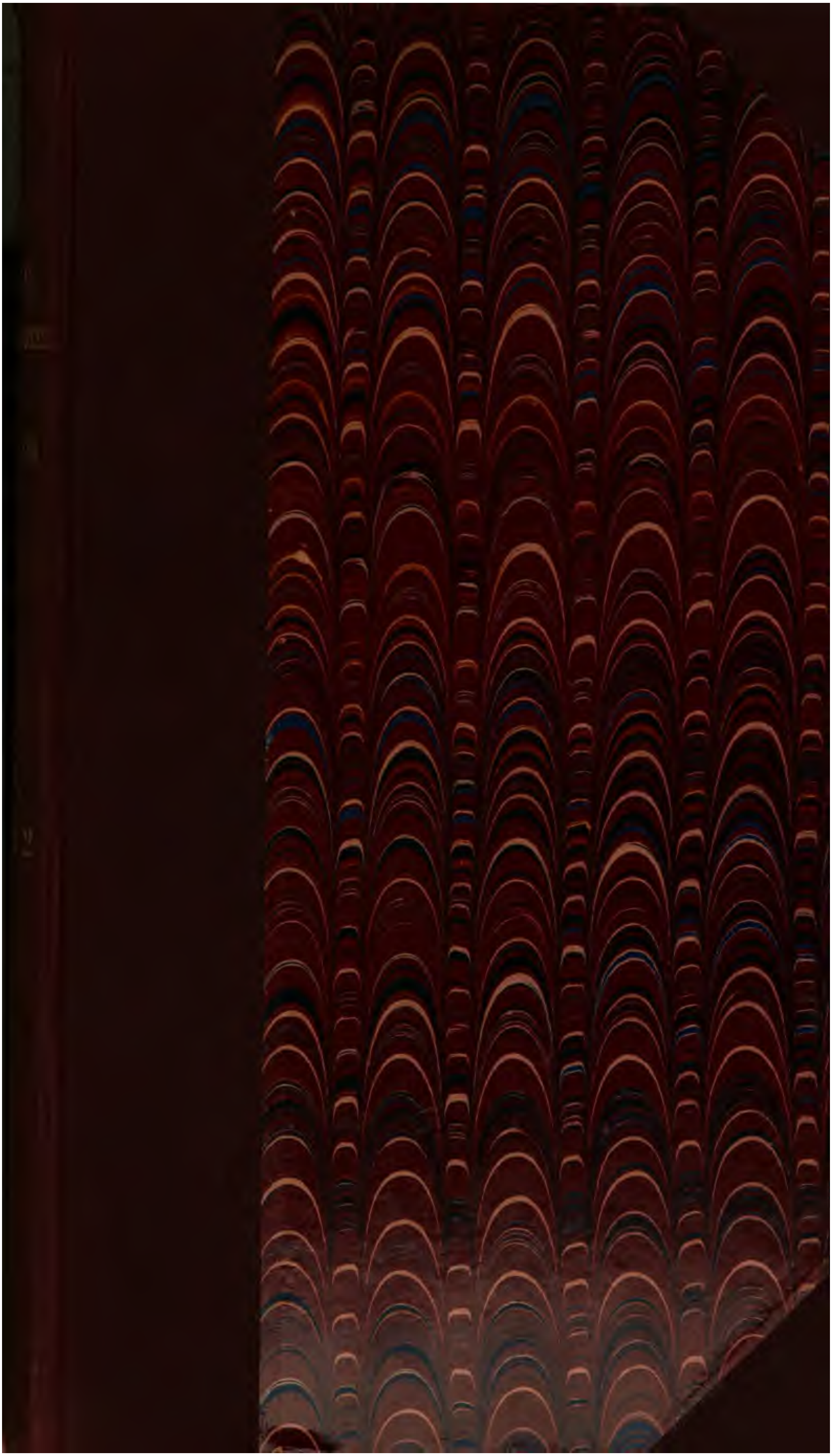

THE

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A QUARTERLY JOURNAL, DEVOTED TO
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W. C. BARRETT, M. D.; D. D. S.;
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DENTAL PRACTITIONER

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CAUSE AND EFFECT.

BY S. B. PALMER, M. D. S., SYRACUSE, N. Y.

Whatever we can see of matter in its various forms is the result of preexisting causes. Nature works by positive laws. Science helps us to understand the principles, so far as we do understand them, and for their application to any department of labor or industry we may safely rely upon definite results.

This assurance should stimulate every dental operator to first learn the causes in connection with their effects, in relation to the fitness of various filling materials to specific conditions of the teeth. Nature pays no regard to earnest desire to do good work, nor to what may be considered the choicest materials; not even to perfect manipulation, unless all is done according to the laws by which success is possible.

This knowledge may be obtained by practice and experience; but, obtained in this manner, it comes only after many years of labor and the sacrifice of many valuable organs. The coming dentist need not wait, as the majority have done in the past, if he would learn the principles which relate to cause and effect in filling.

This paper embraces the scientific points given in the one read before

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The original papers in this number were read at the Twenty-third Union Dental Convention of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York, held in Buffalo, October 27, 28, and 29, 1891.

the Eighth District Dental Society last April, which was recently published in THE DENTAL ADVERTISER. The following is a practical sequel of that paper, rendered in popular language, so far as it is possible to convey the intended meaning. The plan laid before you consists in naming some of the most distinguishing conditions of tooth structure, as seen in general practice, with scientific suggestions as to the proper filling material to meet each condition. By the teachings of science effects may be anticipated, and thus a saving of experimentation secured.

For an illustration, let us consider the two extreme conditions of dentine found in the mouth—the normal, and the lowest grade of poorly calcified structure. The analysis of dentine, as given in chemistry, is sufficiently correct for our purpose, and this indicates twenty-eight parts of organic matter in one hundred. This is the life principle of the tooth, and when unguarded by the mineral constituents which make up the remainder of a normal tooth structure, is in this abnormal condition a conductor of the electric current, and subject to electrical decomposition. When protected by the lime salts, conductivity decomposition and sensibility are so diminished that no harm arises from either of them. As the density of dentine falls below the normal standard, the conditions are favorable for disturbances from any one or all of the three causes mentioned. Time and practice prove that teeth of normal density may be filled with any material which will make a durable and perfectly fitting plug, and all the requirements for tooth preservation will be secured. The material is yet to be discovered which, for durability, the restoration of contour and in popular appreciation, will favorably compare with gold. Scientifically, there is a positive limit to the use of gold for tooth preservation; practically, there can be no such line established. Chemical analysis demonstrates that perfect or imperfect manipulation gives a considerable margin for success or failure. This does not change the fact that, not far down in the scale below normal dentine, gold becomes a cause for undesirable effects.

On the other extreme, consider cases, not uncommon, in which the deciduous teeth have decayed to the gums, or where the incisors of the permanent dentition have lateral cavities in all the teeth; allowing that the age of the patient would admit of perfect operations, no observing or well-read dentist would look for success in the use of gold. There is a principle involved by which failure must be the result. There is a cause for an effect which may as well be introduced at this point as farther on, and it is the grand underlying principle involved in the adaptation of fillings to the conditions of the teeth.

This involves what is known as the "Electro-Chemical Theory," and to avoid the unprofitable discussions which might follow from disbelief or misunderstanding of such doctrines, the substance will be given in popular terms.

It is unnecessary to go over the ground and review the causes of dental caries. We have only to refer to the papers of able writers, given to the profession within the last two or three years, to learn what is known and received upon these points. In accordance with such teaching, we look upon a cavity in a tooth as a cell lined with devitalized or decalcified dentine, a receptacle for remnants of food and secretions of the mouth. Fermentation is the result of such combinations, acid a consequence, and further dissolution of the lime constituents of the dentine an effect. Of course the above conditions include the part performed by micro-organisms.

For our first lesson, let us have in mind two molars with cavities in the grinding surface, of fair size, neither having caused disturbance. Without excavating either cavity, force slightly into one a pellet of black vulcanite, into the other a pellet of graphite. The effects will be widely dissimilar, but not different from what would have been the case had one plug been gutta-percha and the other gold. We wish to grasp a principle that is back of all dental operations, and thus have used other materials for illustration.

Let it be understood that neither pellet could be expected to arrest decay; still the vulcanite would retard in proportion as it displaced fermenting substances, or, in other words, lessened the size of the cavity, while the graphite would increase chemical action by furnishing the element needed to introduce electro-chemical change.

On excavating the two cavities mentioned, after the plugs had been worn a few days, we should not expect to find the dentine inflamed under vulcanite, while the other, which was filled with graphite, would be in the condition in which we generally find the dentine that surrounds loose gold fillings. I think all will agree that a leaky gold filling will increase sensitiveness in dentine. For the real cause, let us study the first simple lesson in electro-chemical action.

If a cup made of zinc should contain water, in which was placed various articles of food, fermentation and chemical change would take place. The zinc cup would be dissolved in proportion to the amount of acid produced by fermentation; the process would be simply chemical. If, however, a plate of copper should be suspended in the fluid, both the copper and the zinc would be affected. There would be a difference of potential between the copper and the zinc, by which is understood, the copper would be negative and the zinc positive. There would be a difference in the electrical relations of one to the other, and the tendency would be to seek equilibrium. Should the two metals be connected above the fluid, a current of electricity would be established and maintained at the expense of the zinc, so long as acid or chemical change continued in the cell. Instead of a metallic connection being made above the fluid, the same effects would be produced by solid substances, such as meat fibre or food which would convey the electric current, though in a less degree. All metallic fillings in the teeth obey this principle and come under this law. The circumstances may be such as to prevent any current, consequently no harm could arise from difference of potential. When a tooth of fairly dense structure is well filled, there is no fluid between the filling and the dentine, therefore no current. Imperfect fillings admit fluids, and perfectly inserted fillings, resting upon poorly calcified dentine, likewise allow circulation, and decomposition ensues.

Let us imagine the third tooth a molar—in all respects like the two mentioned. Let the filling be marble, and the effects will be different from either of the others. The acid, as soon as formed, would find an affinity in the marble, instead of the lime salts of the dentine. In effect, the fluid in the cavity would be neutral, and harmless to dentine. Milkmen add soda to milk when sweet, in anticipation of souring, and thus preserve it longer. Prevention of acids in a cavity or around a filling is equivalent to expulsion of micro-organisms.

Starting upon the basis that gold furnishes no antiseptic properties to arrest decay, but is, on the contrary, a good conductor of galvanic currents, thermal changes, etc., it is the most excitable of all metals used for fillings. In tin, we find a more compatible material. Owing to the soft working qualities of tin, and its non-cohesive properties, cavities are filled with greater pressure against the dentine than when gold is used. If tin combined the cohesive qualities of gold, so as to withstand attrition, it would take the place of amalgam in most operations, with much better success. The conserving properties of tin are due, first, to its adaptability to the walls of the cavity; second, it being of low potential, the current is very slight; third, the compound formed by slight oxydation fills the imperfections in the surface of dentine. Electrically speaking, there is no difference in potential between the filling, fluids and organic elements of the dentine, and consequently there is no decay. In amalgam, we find greater complexity. It is not a homogeneous crystalline alloy, but a compound made up of coarse and fine grains of the alloy and mercury. The finer cuttings are first amalgamated, taking up the free mercury, after which the mercury enters the coarse portions until setting is complete. Any amalgam plug is a compound of mercury and alloy, differing in potential with each cutting, large or small, because of the mass of amalgam that fills the spaces between the filings. There is no guess work about this statement, as the following tests will scientifically prove.

Take any piece of amalgam, file and polish a flat surface, and no trace of alloy can be seen. Wet the bright portion with a weak acid, and slowly traverse the surface with a platinum-pointed electrode in circuit with a galvanometer. Even the slowest passage that can be made with this point causes the needle to vibrate with the greatest rapidity possible for its length. The surface of amalgam is covered with currents, local, active, and counter-active, each grain of alloy differing from every other in potential, according to its degree of amalgamation, and all from the more perfectly amalgamated mass that fills the spaces.

These are facts which must be met in all amalgams made from alloys, cut or filed. This action occurs upon the surface of the plug only, but always when exposed to moisture, even so slight as that contained in normal dentine. Like all galvanic decomposition, there is an acid production. In speaking of gold as an agent of such action, it is a single negative element, while amalgam is a mass of elements, positive and negative, of various grades of potential. Local action is the result, and shrinkage an effect. Under certain conditions microbes die, or starve for lack of sustenance. So these minute currents cease, because the elements become oxydized or blended upon the surface. There is no difference in potential, and the currents no longer act. So much for the surface of the plug.

Still another action takes place in connection with the dentine. The oxides and sulphides form a crust upon the surface of the plug, which tends to increase rather than diminish its size after the first action. In this condition, the amalgam presents to the dentine one element like gold, only of a much lower potential. Again, the oxides and sulphides thrown off from the surface enter into the decalcified surface of the dentine, thereby raising it to a potential equal with the plug. So long as this condition is maintained, neither microbes nor acids will be found there. The low grade of amalgams which do not discolor are wanting in the properties necessary; first, to check local action; second, to equalize potentials. I say low grades, because amalgams are in use which contain gold or platinum to such a degree that the surface exposed remains bright. All these alloys are very hard, the cuttings very fine, and amalgamation is nearly perfect. Owing to the fineness of the mass, there is less oxydation, and by friction the surfaces wear smooth and bright. On examination of the margin of the enamel and dentine, the line of oxydation will be found more distinct than that of the lower alloys. The line will be quite as dark, but it will not enter so far into the dentine.

Let us now take combination fillings of gold and tin. The writer has devoted much time to this subject, mostly in former years, when there were greater prejudices against amalgam than now. It is needless to go over the ground at this time, since I do not use the combination. Tin and gold can be so evenly distributed in foil, and fillings so made that an alloy or crust will be formed upon all surfaces, and the gold cannot be seen. Such plugs resemble good amalgam, are harder to cut, and do not discolor dentine nor admit of decay around the filling. But such perfection is not always attainable, any excess of gold remaining visible, while if too much tin is used, a pit or groove will appear as a consequence of galvanic dissolution. Cavities may be lined or partially filled with tin or felt foil. The tin, in time, will turn to black paste, and the tooth be preserved until a cavity is formed by the wasting of the tin.

Gold and amalgam demand more attention. As a guard filling at the cervical border of the gums, amalgam does better service in combination with gold than an entire amalgam filling would do, for the reason that gold, in contact with amalgam, by reason of difference in potential greatly increases oxydation, thereby destroying local currents in the amalgam and at the same time furnishing the sulphides, etc., which enter the dentine, and thus raise its potential to equal the guard filling. It often becomes necessary to use gold and amalgam in close proximity.

As before mentioned, metals in the mouth possess potential according to their relation to near electrolytes. Such electrolytes consist of saliva, particles of food, decalcified dentine, or fillings of other metals. The metal most negative becomes charged, or stands at a higher potential than all lower in the scale.

To illustrate, let two teeth be filled in approximate cavities, one with gold, the other with amalgam. The gold plug will be at a higher potential than the amalgam. While such fillings remain separated, there will be a feeble current from the gold to the amalgam, through the saliva or lodgment of food which connects the metals. The inner portion of the circuit is rendered complete through the root canals and nerve tract. Currents of this nature are strong or feeble according to the distance of separation, or the conductivity of the intervening matter between the plugs. The greater the resistance the higher the potential of the negative element. Patients often feel the effects of equalization when a tooth that is filled, say with amalgam, becomes so loose that in mastication the amalgam is brought in contact with a filling of gold in a tooth opposite or approximate to it. Shocks will be felt at each contact. Formerly it was taught that gold and amalgam, when used in the same tooth, should be separated, if possible, even by the thinnest septum of enamel, in the belief that bone was a non-conductor. It has been my practice for eighteen years to make the connection as thorough as possible. When the elements touch, the current is confined to the plugs. The current arising from difference of potentials soon polarizes the amalgam, and galvanic action ceases. It can be easily demonstrated that every gold filling in the mouth influences every amalgam filling, no matter whether in the same jaw or in what location. That is, the current passing from one filling to another is distinctly manifested by the galvanometer. Such currents do no harm, but the principle is the same. The current is so strong between gold and amalgam plugs, when only one tooth intervenes, that the tongue readily detects it. In my mouth, I had a small amalgam filling of copper inserted in the center of the crown of a molar which supported a gold clasp, as an experiment. The result was very unpleasant when the tongue bridged over the space from clasp to filling. It did not last many days, for reasons already given.

Patients are not all observers, and if they do detect annoyances often forget them. I believe they have occasion to complain more frequently than they do, of reflex nervous disturbances arising from hidden causes, which are exceedingly difficult to diagnose. For instance, patients complain of neuralgic pains. Diagnosis reveals no satisfactory cause, but two fillings are in contact in adjacent teeth, both appearing perfect, and as both are gold, the conclusion is that the trouble cannot be from the contact of gold; but it may be, it has been, and still is. This seems contradictory to accepted notions of potentials. Certainly, the fillings are not of different potentials, and still the substitution of gutta-percha for one of them would remove the difficulty. It is known that occasionally teeth, which have supported large gold fillings for a number of years, become annoying from thermal changes, without apparent decay around the filling. On removal of the plug, the dentine in the region of the pulp is found to be softened, as though the lime element had been taken away, as, indeed, I believe is the case.

Professor C. N. Pierce, of Philadelphia, at the last meeting of our State Society, stated just this condition, and gave his opinion that by reason of the gold there was some pathological change in the pulp, through which the lime salts were taken out of the dentine, thus in effect exposing the pulp. I am glad Professor Pierce has made the observation, as he will help bear the criticism which may follow respecting the cause of this condition. I am led to believe that not only do fillings produce the change mentioned, but the slow approach of caries produces the same effect. A reversal of the vital current that naturally goes to build up and support the dentine, becomes enfeebled or turned back, with the local effect on the pulp protection that ill health or change of climate has upon the entire denture.

Slight excitement, like grinding or attrition upon the crowns of teeth filled upon sensitive dentine, do stimulate, and deposits often fill the entire pulp chamber. Such stimulants are helpful. Again, when the excitement is severe, no such deposition takes place. On the contrary, the covering to the pulp is weakened from without and from within; from within, by a vital principle similar to that which causes absorption of the roots of deciduous teeth.

With this understanding, let us return and diagnose the current between two gold fillings before mentioned. When a filling is placed in the crown of a tooth separate from any other metal, galvanic action, should there be any, is confined to that tooth. Should the plug be so near the pulp as to cause pain, it would first be in the pulp, from which it might extend to the nerve tract. There would be little difficulty in diagnosing this condition by thermal changes. Now, let us place another tooth by the side of the one mentioned, with a gold filling in it so located that they would be in contact by food or vibration during mastication. The result would be to form a circuit, with a gold conductor on the outside and the nerve trunk beneath. The added gold would only extend the line of action from the tooth first mentioned, so as to embrace both teeth, thereby rendering the current distinctly perceptible. It should be stated that gold fillings do not produce such currents until one or both rest upon sensitive dentine, so that the above need not hinder the use of gold in dentine of average density.

A convenient method of diagnosis for the tooth most affected is with a piece of zinc, which may be held with an instrument. Having wet the surface with the saliva of the mouth, touch the fillings as you would tap a tooth to detect soreness; the current will detect the tooth affected beneath the filling.

Regarding the action of gold upon amalgam: Fillings are not so distant in the mouth that the current cannot be determined between them, but such feeble currents do no harm. Still, any number of gold and amalgam fillings in the same mouth impart a metallic taste after repose. It is well for dentists that patients are not all highly sensitive, or observing of chemical changes in the mouth.

The length of this paper forbids mention of zinc phosphates and gutta-percha, which are by no means unworthy consideration. The following practical suggestions may be of benefit to those who would avoid the effects of currents and thermal changes arising from fillings in contact with sensitive dentine:

First, the effect of all conductive fillings upon sensitive surfaces is to devitalize that portion in absolute contact. That is, sensitiveness ceases by the formation of an eschar, and not, as some suppose, by deposition of lime salts to harden the surface in contact; and this lamina of devitalized dentine must remain, be it thick or thin. In well developed teeth it gives no trouble, nor does it discolor. In poorly calcified teeth its thickness increases and decomposition is the result. To prevent decomposition, creosote, carbolic acid, etc., have long been used, but do not meet a demand for an insulator for galvanic currents and thermal changes, and there is a demand for like conditions.

I am not prepared to announce the best material to use as an insulator. There is a field for experimentation in this direction. The principle is this: When cavities are dried with warm air and lined with varnish, sensitiveness does not return to the surface on being moistened, as it does when no insulator is used. The non-conducting varnish fills the fine scratches made by burrs and excavators, as well as the porous dentine, and quite as well serves the purpose of the oxides and sulphides, so much depended upon in the use of copper and silver amalgams.

Amalgam used in connection with varnish remains bright upon the inner surfaces, which it never does if filled upon bare dentine. This proves an important point,— that there is no chemical action in a varnish-lined cavity, consequently no micro-organisms and no decay.

This principle involves many points not within the scope of this paper; one, however, should be mentioned, and that is, to avoid the use of varnish in cavities like those in the incisors, where the under cut is slight and corners are to be built up, as any intervening lining or oily substance will destroy the mechanical grip which gold has upon dentine and enamel.

The question may be asked, What varnish will best withstand the action of the fluids of the mouth? Practical experiments are being made with various gums and combinations to ascertain what is best. If satisfactory results are obtained, the profession may have the benefits of the investigation. I am using Copal, or Canada balsam cut with chloroform.

Stability of practice indicates that dental skill in manipulating gold has nearly reached its limits, and little more is expected in the way of preparation of gold for filling. When all is done that is possible, we have this fact still before us,—gold is incompatible with highly organized or poorly calcified dentine.

We believe that the adaptability of gold as a filling material can be greatly extended by cavity linings of some insulating, non-conducting agent, which will harmonize the contending elements.

EXAMINING BOARDS *VS.* DENTAL COLLEGES.

BY DR. W. C. BARRETT, BUFFALO, N. Y.

It should be distinctly understood that the preparation of a paper upon this subject is not a self-imposed task, nor the title one of my devising. Your Business Committee expressly charged me with it, and I have never been one who shrank from doing my share at a dental meeting, even though the part assigned me were not that which would be most consonant with my feelings.

I now propose to speak my mind very freely, and if you do not like it, blame the Committee that urged me to the task, well knowing that I was not one who would mince matters. But in whatever I may say, let me in advance disclaim any thought of individual censure, or personal reflection. No one has been a more persistent critic of the schools than myself. I doubt if there be any man in dentistry who has so publicly and openly attacked them for their shortcomings. But when I saw that the things that I condemned were amended, that the colleges were really advancing as fast as professional opinion would permit, that the present system was fully up to that of other professional and literary schools, I gave them due credit for what they had accomplished. My strictures were prompted by an honest love for them and for my calling, by a desire to advance the cause of education, and not by the wish to level all our institutions of learning to the ground and the groundlings, nor by any sense of prejudice or baseless jealousy.

Let me commence this paper by reviewing a little of the history of dental colleges. You all know how Harris was but coolly received when he proposed that the medical colleges should teach dentistry. And the medical schools were right in the refusal. The dentistry of that day was not worthy professional recognition. But Harris and his compeers knew only too well that there could be no profession without some system of professional education. The very term "Doctor" meant teacher, and if there were to be educated men there must be instruction and instructors.

The first dental college was thereupon founded in an experimental way. A new degree was inaugurated, one before unknown. To lift the great body of practicing dentists into an odor of respectability at once, without the tedious process of waiting for the ungraduated to die off in due process of nature, and to make popular the new distinction, it was conferred "Honoris Causa" upon a considerable number of the best exemplars of the dentistry of that day. The old Latin maxim of "Honores mutant mores" was kept in mind, and was in this instance proven true, for the new graduates *sine curriculo* became enthusiastic advocates of the fire-new degree and the shining fresh diplomas. The very charter of the college provided that anyone might appear before its examining faculty, and if he was able successfully to pass the ordeal the degree of Doctor of Dental Surgery should be conferred upon him.

This step, so essential at the time, so fraught with final evil, accomplished its work. The end justified the means, and the degree became so popular that soon there was a call for more schools, and new institutions were founded, closely following the lead of the premier organization. The requirements for graduation were not very oppressive, nor the examinations too technical, for students were graduated at the end of one short term. The dogma that some very short-sighted, unthinking men of to-day occasionally advocate, that "knowledge should be recognized wherever and however obtained," governed the conferring of degrees.

This principle, so specious in sound, so disastrous in consequences, soon produced its legitimate results. The faculties of the various institutions were the supreme judges as to qualification, and could establish any standard that they might choose. The requirements became less and less, until the culmination in the Delavan fraud in Wisconsin. The standard of that school was the name of dentist and the possession of the sum of twelve dollars. The "faculty" of that institution firmly believed in "recognizing knowledge wherever and however obtained." That was the very corner-stone upon which the school rested, and it did not essentially differ from the basis structure of other schools, except that it was more liberally construed. Foreigners were graduated at most of the schools, without any knowledge of the English tongue in which the instruction was given. The colleges, you see, were "recognizing knowledge whenever and wherever obtained." The degree of Doctor of Dental Surgery fell into disrepute in foreign countries, because it was so promiscuously conferred. Foreign dentists of repute refused to fraternize with the graduates of American colleges. The very means that had been primarily employed to make the degree popular now operated to condemn it. The schools were killing their goose as fast as possible, by conferring honorary degrees in profusion, and by graduating incompetent men.

It was about this time that a few earnest men established a journal, that they might have an organ to express their very decided opinions upon these questions, and to labor for what they believed to be the best interests of the calling to which they had devoted their lives. They proposed to reform some things, or to batter out their own brains in trying. They could have no ulterior motives. They did not expect to make a cent, or to do much for themselves personally, save to gain a few enemies. The present speaker became the editor of that journal, and it is the one work of his life upon which he looks back with unalloyed satisfaction. We were a lot of Don Quixotes, with something more than a barber's bason in place of the helmet of Mambrino, and we were around looking for windmills to attack. The first one that had attracted our attention was this educational question. For one, I was certain that the ill-odor into which the D.D.S. was fast falling was due to the villainous system of "recognizing knowledge whenever and however obtained." It was a standard set upon a convenient sliding scale, and every school could interpret it to suit its own ideas. Under that plausible plea every irregularity that existed had found entrance. As long as that was the criterion, every school being its own judge of the quantity of knowledge to be recognized, the Delavan College was, in principle, as respectable as any other.

The *Independent Practitioner*, almost with the first number issued by the New York Dental Journal Association, in both its "Original Communications" and its "Editorial" departments, began very freely to discuss the subject. It asserted, what should be apparent to every intelligent mind, that colleges were not organized for the granting of degrees. Their business was to teach. They had no more right to "recognize knowledge whenever and wherever obtained" by the granting of a diploma upon a mere examination, than they had to pronounce upon the qualifications of clergymen or lawyers. Their sole duty was to conduct students through a prescribed curriculum of study, and this accomplished, it was proper to give them a certificate of the fact. The college diploma was just this certificate that a regular course of study had been pursued, and it could be no more. The schools could not, with any degree of propriety, attempt to pronounce upon the qualifications of any student, aside from the fact that he had finished a definite course of study.

Being fully satisfied of this, the *Independent Practitioner* began to attack the very foundations of the then method of conferring degrees. The journal bitterly opposed the acceptance of any term of practice as equivalent to a term of school. Twenty years of reputable practice had at first been accepted in lieu of a year's tuition. Then twelve years was deemed sufficient. This soon sunk to five years, and finally the most of the schools were practically graduating students upon the mere statement that the candidate called himself a respectable practitioner, and upon his nominal attendance upon one short course of lectures. The editor of the *Independent Practitioner* had for some time been accumulating evidence that some of our most reputable schools were making the attendance for the one winter a mere matter of form, and when he was properly loaded the fight began by the publication of an article attacking the oldest of our colleges for graduating some of the most reputable practitioners in America upon a mere examination. We thought that we might as well begin by aiming at the head. Nothing could be accomplished by charging upon those schools that had little of reputation anyway.

Advantage was taken of a clause in the Dental Act of the State of New York, which prescribes that a college must be recognized as reputable by the State Dental Society before its diplomas shall be accepted as a legal qualification. Charges were preferred against this same college for graduating students without attendance upon its full curriculum, and it was summoned to show cause why its name should not be stricken from the roll of reputable institutions. This was done, not in enmity to the college, but because a broad principle was involved, and the right or wrong of the matter could be best established by commencing at the top instead of the bottom.

The Dean appeared at the stated time before the Dental Society of the State of New York, and showed that the school had been but following an old and well established practice, one that most of the schools accepted. It was with the utmost difficulty that some of those now within the sound of my voice were held in line, and prevented from quashing the whole proceedings by their votes. They did not fully comprehend the breadth of the attack that was made, and regarded it as the outbreak of a prejudice against our oldest dental college.

But the Dean frankly acknowledged that the college had become satisfied that the practice was an evil one, and they were but waiting until they could with propriety revoke the offer to so confer diplomas, and that the grand old school did not propose longer to postpone a step in advance. Upon this, the editor of the *Independent Practitioner* moved that the State Society express its entire confidence in the college, and pledge itself that it would very heartily support it in the new departure. From that time to this the Baltimore College of Dental Surgery has been foremost in the work of reform.

Then commenced the publication in the *Independent Practitioner* of a series of articles severely criticising and condemning all schools which granted diplomas without a faithful attendance upon the full term of study. The college which had been summoned before the New York State Dental Society, true to its enunciation of principles, took the initiative in organizing an association of the faculties of the best schools, and in raising the standard of graduation. It was discovered that all the colleges were sick and ashamed of the then lax condition, but that each was afraid to inaugurate a new system, because they had little confidence that the sentiment of the profession would sustain them, and feared that all the students would go to the institution which granted its so-called honors upon the easiest terms. Every enquiry from proposed matriculants was as to how quickly and with how little knowledge one could receive a diploma. It was the degree, and not education, that men seemed to seek. But a solemn agreement was entered into by the leading schools, that diplomas should only be conferred in full course. The principle for which the *Independent Practitioner* had battled was conceded, and that journal at once announced that the fight was over. Henceforth it would be found a supporter of the schools, instead of their merciless critic, so long as that agreement was kept in good faith. The colleges having plainly evinced a desire to advance their own status, it was time to call off the dogs, and since then it has been mainly the puppies who have continued the war.

The compact entered into by the colleges has not only been respected by nearly all the schools, but the standard has been continually raised, just as fast as the sentiment of the dentists as a whole would permit. In fact, the Association of College Faculties is becoming a rather radical body. They have gone too fast, in the estimation of many. The term of pupilage has been extended, and the semesters have been lengthened. With this present term they open an obligatory course of three years instead of two, and of five months in place of three, while nearly or quite all of the best of them demand an attendance of seven months at each term. Already they are moving to make this nine, while a number of colleges have practically a school term of twelve months in each college year. At the last meeting of the Association of College Faculties, a resolution was introduced looking toward the extension of the term of pupilage to four years, instead of the three upon which they were just entering.

The graduates of fifteen years ago would now scarcely recognize their Alma Mater. The granting of honorary degrees has been practically abolished. No college can confer a diploma, except in course, without first obtaining the consent of all the other schools in the Association. Students must be in actual, daily, faithful attendance upon college lectures during the whole term of pupilage, or they are debarred from coming up for graduation. Any student who is twenty days behind in his attendance forfeits his privilege of examination. He must be as faithful in the laboratory and clinic rooms as in the class room. Every hour of every school day must be strictly accounted for. A daily roll call, at both lectures and clinics, is insisted upon. A graded course has been established, and the students divided into freshman, junior and senior classes. The curriculum has been greatly extended. More teachers have been added in all the schools, and wonderfully increased facilities provided.

The proportion of plucked or rejected men is constantly increasing. Entrance and passing examinations of a continually augmenting stringency are provided for. Every school is held to a strict accountability by its associate schools, for they keep a close watch upon each other. This responsibility of each college to all the rest, covers not only its manner of teaching and of granting diplomas, but its discipline and internal regulation as well. At the last meeting of the Associated Faculties one school was suspended from membership for a period of two years, because it had conferred a diploma upon a student who had not been faithful in a full attendance upon college lectures. This suspension is a serious matter, for it means that no college will receive a student from it or dismiss one to it, nor will its diplomas be recognized in any manner. The discipline must be effectual, unless the Examining Board of the State in which the school is located overrides the decision of the Association of College Faculties, and permits its graduates to enter upon practice, notwithstanding the irregularity. But if this is done there will be a grand explosion, that will blow somebody or something entirely out of the water.

All this has been accomplished in seven short years. Order has come out of chaos, and the complaint among those most concerned now is that the difficulties attendant upon graduation have been made too apparent, and that qualifications that are unreasonable are demanded. In fact, there is grumbling that it is now too difficult to obtain a diploma, especially upon the part of those old practitioners who are without any degree, and who claim that the schools should "recognize knowledge whenever and however obtained," and "place the proper stamp upon merit," they themselves having a rather clear idea as to where such knowledge and merit can be found.

The men who made the fight in the first place, and who may conscientiously claim to have had something to do with instigating the wonderful progress, are not now found among the howlers at the schools. They have watched the workings of the new order of things too closely not to be satisfied with the rate of advancement, and to recognize the conscientious efforts of the schools for a better state of things.

Who then are the critics of to-day? In the first place, they are largely the ones who know least of the schools. They are too often dentists who do not keep up with the procession, and who do not know what has been achieved within the past seven years. They are in large part the echoes, the repeaters of the opinions of more original men. The majority of them are the men who shout with the biggest crowd, without exactly knowing what they are hallooing for. In the year 1884, there was a grand attack made upon the then methods of most of the schools, and a considerable number of the critics of to-day were their indignant defenders. In the course of five years they wakened from their lethargy, and to show their zeal and to exercise their voices they began to bark at the old hole, not realizing that the game was now in quite different quarters. In the course of five years more they will discover that they are on a false scent, and will then become the apologists for the schools, through thick and through thin.

We who were in the fight of 1884, well remember the clubs and stones that were thrown at us for disturbing the peace of Israel. American dentistry, we were told, was the pride of the world, and American dental schools were the *summum bonum* of all good. Those who criticised them were unpatriotic; were actuated by unworthy motives and bent upon the ruin of our educational system. But now, when a better condition has been inaugurated and the schools are redeeming their laurels, these men are the assailants. They are simply seven years behind the time—that is all.

The colleges are yet a long way from perfection. There is plenty of room for improvement. But the great reforms wrought within the past seven years, and the present continued rate of advancement, should bring immunity from the charges that they are conducted simply for pecuniary profit, and without a due regard for the best interests of dentistry. Indeed, it is not at all certain that dentists will sustain and support the colleges that are engaged in raising the standard. The schools outside the College Association are meeting encouragement in quarters where this should be least expected.

The organization of dental examining boards was but the natural outgrowth of the old methods of granting degrees. When the schools were graduating men upon a mere examination, and that too often but a pretense, there was an importunate call for some authority to scrutinize the work. Influential men in certain States secured the passage of laws authorizing the appointment of dental examiners, and in some instances these laws made such a board the supreme authority to regulate the practice of dentistry, utterly regardless of the only possible source of instruction. Then these men got themselves appointed members of such boards, and they had the neatest and tightest little system of irresponsible authority ever devised. So far as their own State was concerned, the profession was their vassal. Sometimes—by far too often—these Boards were composed of men who had never attended a dental school a day in their lives. But they were men of experience, and self-acquired knowledge. They knew nothing of the methods of the schools, but they knew what a dentist ought to be in daily life. They were ignorant of theory, but they knew practice. Their power was a wholesome check upon the schools.

The members of these boards naturally fell violently in love with their autocratic position as critics of the expert teachers, and as instructors and mentors of the pedagogues. They assumed an air of superiority and grasped the ferule threateningly. I am credibly informed that it was openly asserted in a meeting of the Association of Dental Examiners, and that too by a man whose diploma is only an honorary one, that they are the superior body and have the right to dictate to the colleges. Men who never passed an examination themselves assumed to examine others. Those who never were at school sat in judgment upon the methods of the schools.

Naturally this has caused irritation. The college faculties have doubted the ability of some of these men properly to conduct an examination of college graduates upon subjects with which the members of the board are not acquainted, and have asked that in case of the rejection of a graduate a list of the questions and answers should be furnished the school implicated. Of course, if the questions were fair ones and the candidate actually exhibited ignorance of that in which he should have been instructed, it would be a deadly blow to the college. One would have thought that this opportunity to smite the schools would not have been refused, but instead of the granting of the request a rather disdainful answer was returned, and the colleges were informed that they had no rights in the matter.

Thus a breach has been formed that is constantly widening, and that promises only evil to dentistry. There is a necessity for examining boards, and most certainly the colleges are essential. Let it not be forgotten that there is no other source of instruction. Examining boards do not teach. They only find fault with those who do teach. So far as education goes, they only sit in the breach and throw clubs. They give the students nothing, and if they but drive them away from the only source of instruction, I ask in what way are they a benefit to dentistry?

Let me not be understood as charging that this is a true picture of all the examining boards, or a faithful representation of every member. There are those who know our educational system very thoroughly, or knew what it once was, and they are imbued with nothing but the wish to serve the profession and the people. [We know that this is the case, for they have told us so themselves.] Will they not allow as much of disinterestedness in others? Are they the only ones actuated by worthy motives? While they are working faithfully in their chosen field, can they not allow the same privileges to their brethren? Some of them are broad minded and liberal in their views. But a considerable proportion of the contemners of the schools are those who are least qualified to express an opinion.

The amount of the matter is, there is a great misunderstanding of the functions of a college. The schools cannot make dentists. They cannot impart brains, or gumption. They can do nothing but teach, and if a student is not disposed to learn they cannot do even that. Their business is simply to offer opportunities for obtaining an education. They can only lead the pupil through a specified curriculum of study, and when he has mastered that certify to the fact. If he has not the mechanical ability to make a pig-trough, they cannot impart it. They can teach him the theory of dentistry, and practical mechanics, but they cannot convey the ability to make a diagnosis.

There are all sorts of sodden fools in the pulpit. Do men blame the theological seminaries because every pastor is not an eloquent orator? There are stupid lawyers, who cannot properly conduct the simplest case in court. Is that the fault of their instructors? There are doctors who cannot distinguish a case of stomach-ache from a psoas abscess. Is that chargeable to the medical colleges? If it is because of professional ignorance the schools may be to blame, but if it is owing to mental incapacity the critic should go the man's Maker, and not to his teachers.

But it may be answered that a student should not be accepted if he has not sufficient ability. What standard of talent shall be established, and who shall determine it? Should the common schools be closed to children who do not come up to some fanciful line of intelligence? The usual theory is, that the greater the lack of brains the greater the need for schooling. It is quite impossible for the dean of a college to determine who, out of some hundreds of proposed students, has all the ability requisite to make a first-class dentist. There is many a singed cat among the hayseeds who present themselves at a college door. The fellow with the hardest cheek and the best clothes is quite apt to be found at the foot of his class when the grand trial comes. The dean must receive a hundred men in two or three days. He does require that the applicant shall present evidence that he has a fair education — enough to enable him to comprehend technical studies — but mechanical and professional ability can only be determined upon an extended trial. Once having matriculated, the student has the right to pursue his course to the end, and if he can then demonstrate that he has been taught the things essential to know, he must receive the certificate to that effect.

All these things should be taken into consideration by the Boards of Dental Examiners, and they must try to work in harmony with the schools, or they will certainly go to the wall. Colleges are an absolute necessity. There can be no education without them. Examining boards have important functions, but let it not be forgotten that they can only live in the presence of the colleges, and that the sole reason for their existence is that they may assist the work of the schools, by insisting upon the thorough professional education that is provided only by the schools.

Our English brethren are meeting the same difficulties that we encounter. The students in their schools are not always the brightest minds, but I never heard that the teachers were blamed for that. A year ago I listened for two days to a debate in the British Dental Association, upon this very theme of education, and I found that Americans were not alone in their embarrassments. There is no Association of Colleges in England, and as a consequence there is no accepted standard, that of some schools being higher than that of others. So much is this the case, that graduates of those institutions whose requirements are the highest append the name of the school to their titles, an L.D.S. London, ranking higher than some others.

Had all the American Boards of Dental Examiners pursued the even tenor of their way, laboring as unostentatiously to advance the cause of dental education as has that of the State of New York, the present embarrassments would not have succeeded. But what is the consolation in getting upon the top of the fence unless one can shout and attract the attention of the passers by? Our Board has always confined itself to the discharge of its legitimate duties. With the single exception of our bastard State degree, one that has neither legitimate educational father or mother and which does not pretend to be an evidence of having pursued any course of study whatever, our law is a model of good sense, and our Board in the discharge of its duties may stand as an exemplar to the world. One does not hear from its members the invitation to look and see what great men they are, and how they are guiding the destinies of all Christendom. We hear no groan from them that, like Atlas, they support the world, but their influence is quite as potent in the State as if they magnified their office above all the earth.

If students who have gone through the full curriculum of any recognized college are to be examined by a State Board, it should be before their graduation. I have for some years advocated the appointment of a Board of Regents, before whom should appear all the students of every college in the State, and which alone should be empowered to grant degrees. This would place all the schools upon the same plane, and would give the proper encouragement to the well equipped, for students would seek the institution that gave the surest promise of graduation. It would take away all incentives to a shortening of the course, and would leave the faculties to the uninterrupted performance of their sole duty—that of teaching. Such a law has been passed by our Legislature, and is in force, or is about to be enforced, in the medical schools.

In the State of New York, as I have before said, no diploma is a sufficient qualification for practice until the school that granted it has been duly recognized by the State Society, acting through its Board of Censors. It is the duty of this board very carefully to enquire into the methods of teaching, the equipment and the general conduct of any school, and having determined that it is doing faithful, honest, legitimate work, it is placed upon the list of recognized schools, there to remain so long as it is worthy recognition. If at any time it prostitutes the power granted it, the society may, as it has done before, summon the school to answer any charges preferred against it, and if these are established it can be stricken from the list, and henceforth its diplomas are not worth so much as the paper upon which they are written, so far as this State goes.

That is a correct principle. The examining boards should keep an eye on the colleges, and hold them to a strict accountability. But to make no discrimination between the good and the bad, to condemn all alike and unheard, is to place a premium upon ignorance and dishonesty. It is to discourage education and to debase our calling to the level of a mere trade. It is the befouling of our own nest, which is said to be the characteristic of a dirty bird. No man will enter a college door when he is virtually informed by those to whom he looks for ready-made opinions that the diploma means nothing, that for his three years time and his hundreds of dollars expended he has nothing of value to show, and has not advanced himself in the estimation of those who should be the best qualified to judge.

No one who is fit for the position will become a teacher, if he is but to be the target for abuse and misrepresentation on the part of those who should stay his hands, and if he is to be charged by those who call themselves honorable men with being a cheat and a fraud. No, gentlemen. Our schools must be sustained if we are to maintain an honorable status among the callings of the world. Without schools and without a literature, dentistry will lose the honorable position it has gained, and you and I will sink to the level of the charlatan and the imposter.

EXAMINING BOARDS *VS.* DENTAL COLLEGES.

BY PROFESSOR J. FOSTER FLAGG, PHILADELPHIA.

To my grateful appreciation of the invitation to attend the annual Union Meeting of the New York State District Dental Societies, I must add my sincere regret that I am unable to accept it. But I have felt that the mere title of the tenth essay, as given upon the official program, calls for, at least, the first of a proposed series of papers upon that range of subjects of which the discussion of "Examining Boards *versus* Dental Colleges" must form a most important part.

The cause of systematic dental education is one for which I have labored, both earnestly and faithfully, for more than thirty years, and I have, therefore, had ample opportunity for observation as to the many advantages, as well as the numerous defects, which appertain to the developed plan which, while at present very properly, I think, partially accepted, is yet equally properly (I also think) very freely discussed, and, in large degree, very correctly censured.

It is for reasons too numerous to incorporate in this paper, but which are entirely conclusive to my mind, that I have hailed the formation of State Dental Examining Boards as a glorious possibility in the work of progressive dental education, and it therefore seems to me that to discuss these organizations at this day, after years of trial, as "Examining Boards *versus* Dental Colleges," is an astonishing illustration of the complete misapprehension as to the relations which should exist between colleges and boards.

I am too sadly aware of the shortcomings of college work, and even of such as were of necessity regarded as of the best, because, poor as they have been when viewed from the ideal standpoint, they have, nevertheless, actually been the best. I can truly say that I have striven unceasingly for the improvement of both means and opportunities for the gaining of knowledge, and for the most important work of its practical application, and yet I have recognized as fully as anyone how very much less than I have desired has been the result.

But on the other hand, I must assert for the credit of dental education as even now established, that we have sufficient evidence that much more competent young practitioners, in larger proportion, are prepared for practice than have ever been produced by any previous method. I have also had quite as much knowledge of the "human frailty" side of faculty work as has any outsider.

I know that candidates for graduation can answer questions asked by their teachers much better than when put in a different way by other examiners, and though I would readily admit that a thorough knowledge would preclude this possibility, I would yet ask, who among all of us could gain that thoroughness of knowledge appertaining to the various subjects comprising the education of a dentist, in a three years' course, or a ten years' course, or even in anything less than a lifetime of study and practice?

I know that knowledge of hard work, constant attendance, excellent deportment and evident love for the work and earnest desire to learn, upon the part of the candidate, will so soften the hearts of members of faculties that they will vote upon the "reasonable hope for the future," rather than upon the absolute attainments of the present; and I ask, who among you can say that he would not do the same?

I know that all kinds of deception can be practiced by unprincipled, short-sighted candidates, and that it is practically impossible that faculties should not be thus deceived, though it is taught, most warningly, that those who act thus deceive themselves the most of all—but even then the temptation is too great, so long as a diploma continues to be a guarantee of right to practice.

And with this knowledge, do you wonder that I have hailed with joy the great possibilities, as co-workers in the cause of education, of the Dental Examining Boards?

And do you wonder at my astonishment at, and my protest against, the title "Examining Boards *versus* Dental Colleges"? Instead of *versus*, it should be *paritas* or *simul*, always!

What general would organize an army in such wise that in battle his artillery would be *versus* his infantry? What kind of city government would that be with its police *versus* it mayor and councils?

And so, if in any work the departments should be shoulder to shoulder, united by the strongest bonds, ignoring self-interest for the love of the greater work (if that be humanly possible), this should exist in education.

It is upon education that the highest hopes of the human race are based. It is the perfecting, or at least the improving, of educational work, which is the grandest problem of our day. It is a task which is truly Herculean, and which therefore demands the most conscientious endeavor and the most united effort.

That good may be the outcome of this work is my sincere desire, and it is to this end that I give you as my "sentiment" "Examining Boards AND Dental Colleges."

EXAMINING BOARDS *VS.* DENTAL COLLEGES.

BY PROFESSOR C. N. PIERCE, PHILADELPHIA.

* * * I should very much enjoy being with you at your coming meeting, and the giving of my views on education, but they cannot be considered as from a dental college standpoint, because I am alone of all the teachers, and have been much criticised by the faculties of other schools.

But, notwithstanding this, I hold, as I have done for several years, that the hope of our profession and of our best schools is in the "State Boards of Dental Examiners." We cannot have the standard desired until the power of granting degrees is beyond the control of teaching faculties, and vested in the hands of a *competent* board. I know that the excuse is made that boards as now organized are oftentimes the subjects of political intrigue or favoritism, but we must recollect that they are yet new, and are now passing through an evolutionary process, and it will take some time to have what is desired or required; but it will come in due time.

But with all these imperfections, they are safer to-day to judge of the qualifications of the candidate for practice, than a faculty depending wholly upon the class for support or compensation for exhausting labor rendered in teaching.

EXAMINING BOARDS *VS.* DENTAL COLLEGES.

BY PROFESSOR FRANK ABBOTT, NEW YORK.

* * * It would afford me much pleasure to accept your invitation to be present at your meeting, and if I were able to leave my post I should certainly be there. But I do not attach as much importance to the discussion of the subject, "Examining Boards *versus* Dental Colleges," as you do. In the first place, there is no such question before the profession, that I am aware of. The examining boards and college faculties are not working or talking against each other; consequently any discussion of such a subject, in my opinion, would be altogether out of place.

THE TWENTY-THIRD ANNUAL UNION CONVENTION OF THE FIFTH, SIXTH, SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

The twenty-third annual convention of the Fifth, Sixth, Seventh and Eighth District Dental Societies was held in the city of Buffalo, October 27, 28 and 29, 1891. The officers of the Eighth District Society, within whose jurisdiction the meeting was held, conducted it, the members from other districts attending as the guests of that society.

The State of New York, for dental society purposes, is divided into eight districts, a society being established in each, and all sending delegates to form the State Dental Society. Before the passage of the State Dental Law, in 1877, the dentists of the western half of the State were organized as The Western New York Dental Society, that association having been formed in 1862. The union meeting of the four western district societies of the State, which takes the place of their semi-annual convocation, is practically a continuation of the old Western New York Society, which under its different names has therefore been in existence twenty-nine years.

The meeting was called to order in the parlors of the Iroquois Hotel, by the President of the Eighth District Society, Dr. F. W. Low, of Buffalo. The minutes of the last union meeting were read by the secretary, Dr. W. A. Barrows, of Buffalo, and the proper announcements were made and the programme presented by the chairman of the Business Committee, Dr. C. S. Butler, of Buffalo. As all the arrangements are made by the District Society with which the meeting is held, there is very little of business to distract the attention of members from the reading and discussion of papers. A large number from the different societies were present, and a number of visitors from abroad, among whom were Dr. J. Taft, of Cincinnati, Dr. G. W. Field, of Detroit, Dr. C. R. Butler, of Cleveland, and Dr. C. S. Beck, of Wilkesbarre, Pa.

A paper was presented by Dr. S. B. Palmer, of the Fifth District, denominated "Cause and Effect." (This paper is printed in full in this number. See page 1.)

After its reading, Dr. A. P. Southwick, of Buffalo, was called upon to open the discussion.

He said: I don't know that I have the ability properly to discuss this paper. I have had the privilege of perusing it before its presentation here, and was very much interested in it, as I have been in all that Dr. Palmer has presented on the subject before. Chemical action of the saliva I have always held to be an important factor in diseases of the mouth, and since reading this paper a case has come under my attention which has emphasized it.

I would like to ask Dr. Palmer, what is his theory concerning the destruction of copper amalgam. I have used this material for filling teeth quite extensively, but have abandoned it, because I have found in fifty, yes, probably in seventy-five per cent. of such amalgam fillings, the material has become "cupped" upon the crown surface. This does not take place upon the other surfaces, nor upon those that discolor or turn dark. But I have become disgusted with copper amalgam fillings, because of having to remove so many. Perhaps Dr. Palmer may be able to throw some light upon this tendency. It is a practical question, and we are all interested in it. In the course of a long practice one sees many things that are not readily comprehended. There are many questions concerning the calcification of teeth that are not yet answered, and there are many more that need much study, concerning the dissolution of teeth, the formation of furrows in them, and that so long vexed question of tooth abrasion. I wish that this theory of Dr. Palmer's could throw a little light upon them.

Dr. C. T. HOWARD, of Rochester: Dr. Palmer has shown that there are certain electrical currents in the mouth, but how shall we distinguish what electrical currents are injurious? Electrical action is potent for synthetical as well as analytical purposes. Wherever there is disruption there is very apt to be aggregation. An electric current may be curative as well as destructive. I was very much pleased with the part of the paper that I heard, and only regret that I could not listen to all of it.

Dr. R. H. HOFHEINZ, Rochester: I desire to call attention to one point that Dr. Palmer mentioned in his paper, concerning the combination of tin and gold. He says there will be a disintegration of the tin and of the tooth, a cavity being formed at the margin. I have had occasion to examine teeth filled by Dr. Abbot, of Berlin, and in my ignorance of its character removed one of those fillings that had been in, at that time, twelve or fifteen years. While I found disintegration, I could not discover any cavity proper, nor was there any decay in the dentine under the filling. In all the observations made since that time I have never been unable to find any cavity of decay in such cases.

Dr. PALMER: I have a patient who has several fillings inserted by Dr. Abbot. Those in which the gold is upon the surface do not decay or disintegrate as much as if the tin formed a part of it. I have discarded the tin and gold, because it is not as good as gold alone, in such places.

Dr. C. S. BECK, Wilkesbarre, Pa.: I have a patient who will not allow anything in her mouth but gold. About two years ago I inserted two large antagonizing fillings, and she soon returned, complaining of a considerable amount of pain attending thermal changes. I removed one filling and put in rubber, and the annoyance ceased. I would like to ask if there was any chemical or electrical condition that caused that difficulty.

Dr. PALMER: I think the paper distinctly alludes to such cases, and states that irritation may be induced by the contact of two gold fillings. Although there is no difference in the potential, there is an extension of the condition over the line to the next tooth, and thus a circuit may be made. I have recently had a case in which a bridge was inserted, and a gold cap approximating to and next to the wisdom tooth. When there was a shaving of gutta percha between these the pain ceased. It is evident what was the trouble. The current made its connection through several teeth, so that the circuit passed through the nerve trunk. When the filling in the wisdom tooth was removed and gutta percha substituted, the annoyance ceased. Some one has asked about the "dishing" of copper amalgam. The amalgam is composed of but two elements, copper and mercury, and it is not an absolute alloy. Nature goes to work to separate the elements by chemical action. If the fillings remain bright and polished, it is for the same reason that the plates in a battery keep bright. The dishing is done by counter-currents induced by the two elements — between the copper and the amalgam — and the reason that this does not occur on approximate surfaces is because they have become polarized.

Dr. W. C. BARRETT, Buffalo: I am sorry to see so many years of thought and careful observation passed over so lightly as has been the case here. We do not get down to the basal facts which I think Dr. Palmer desires to have considered. We have known him for a great many years, and know what a patient, careful observer he is, and how much of labor and thought he has given to this subject, which he denominates electro-chemical action. The question is not one of gold, or tin, or gutta percha, or amalgam fillings. It is the electric currents, the result of chemical action, which the author of the paper says may disintegrate both filling and tooth. Dr. Palmer has expressed to me the desire that the subject should be thoroughly and scientifically discussed. That implies the presentation of both sides; the objections as well as the supporting arguments. I want to examine his theories in all lights.

I know, Mr. President, that I am apt to be critical. Upon any subject that I can comprehend I am apt to form an opinion; and that is not only the right, but the duty of every thinking man. Dr. Palmer and I are at variance over this matter. I would like to consider, for a few moments, the principles upon which the paper is based. I need not recount to you that chemical action and electric currents are but different manifestations of the one unit, force. They are not to be considered as entities—

separate and distinct forces. Chemical action is changed into electricity, and that into light and heat, as we every day see exemplified in the battery cell, and the electric light and cautery. Chemical action is the precedent, and an electric current the result. You who have electric bells or motors, or what not, see that constantly exemplified. But it requires an isolation, an insulation, to preserve this electric current, which is the result of the chemical action in the battery. If the circuit is not made complete by insulation, the current, which is the effect of the chemical action is dissipated, or manifested as heat.

This insulation is impossible in the mouth. Try the old experiment of a piece of copper on one side, and a piece of zinc on the other side of the tongue. Keep them apart until chemical action is established, and then touch them together. You will get the demonstration of an electrical current. But fill the mouth with water, which is a conductor, and destroys what of insulation there was, and the current, if there is any, is instantly dissipated. There is no longer any current existent.

I can readily understand how and why there should be such a thing as chemical disintegration of the teeth, and an electrical current be thereby generated, which, if it can be conducted to any definite point and there concentrated, may produce a definite result. I can comprehend that certain feeble, impotent electrical currents may be generated, only to be instantly dissipated. But I cannot conceive of electricity in the mouth, except as the result of the chemical changes which are pre-existing, and which are sufficient to account for the disintegration without introducing another factor, which, it seems to me, could not be sufficiently powerful to produce any special results whatever. I cannot understand how that which is but an effect can be a cause. It seems to me that the title of Dr. Palmer's paper would be more consistent if he would reverse it, as from my standpoint he has the subject itself, and would call it "Effect and Cause."

I know that the author of the paper under discussion has studied the subject more exhaustively than I have, but all that does not give him liberty to judge for me. I must think for myself, and I cannot but believe that he has commenced at the wrong end, and made progress in the wrong direction. Theoretically, it may be that there are multitudes of currents between the constituent parts of an amalgam filling. Practically there can be no such thing, because as soon as formed they must be dissipated. Theoretically, if you stamp your foot upon the ground, the whole earth trembles. Practically, you may wear your heel out, without affecting anything but your heel. We do not fully comprehend the great manifestations of force. It is a hidden subject, and hence gives unlimited scope for the building of theories more fanciful than real. Potential is a beautiful word, but, like all potential moods, it is a "may be" rather than a "must be." It is one of those indefinite terms which electricians use in a much different sense from that in which Dr. Palmer employs it, to express something that is quite uncertain and unknown.

I thank Dr. Palmer for the paper, as I have always been thankful to him for his other studies upon the same subject. He is a thinking man, and he sets me to thinking, and hence is infinitely more instructive than the one who only pats me on the back, and says to every enunciation, "The gentleman is quite right, I heartily agree with his beautiful statements."

Dr. **PALMER**: If Dr. Barrett has not studied this enough to know that there is a difference between filling up the two teeth I have mentioned, and introducing a piece of gold and a piece of gutta percha loosely — if he has not got far enough along to comprehend the difference in electrical conditions — then he is not far enough advanced in the foundation of the principles for it to be of any use in making an argument.

A paper was read by Dr. W. C. Barrett, upon "Examining Boards versus Dental Colleges." (This paper is presented in full in this number. See page 9.)

DISCUSSION.

Dr. C. S. **BECK**: I claim to know something regarding the duties of the examining boards of the State of Pennsylvania, and also the sentiment of the Dental Society of that State. I have had the honor of serving on the board for seven years. When it first was formed, in 1876, discussion arose as to what should be the character of this examination, and it was agreed, in Philadelphia, that the examination of the State Board of Pennsylvania should be very much severer than that which any college would give the student. This State Examining Board has, I think, for many years continued to enforce the resolution passed in 1876, and I wish to assure the dentists of the State of New York that no man passes the Examining Board of Pennsylvania unless he is fully qualified. It is hoped that the State law will be so amended that a standing committee shall be appointed, whose duty it will be to see that no man enters upon the practice of dentistry except he comes from some reputable college. As the law now is, the Examining Board must endorse every diploma issued by a college in Pennsylvania, before that diploma becomes legal.

It would take a long time to tell you the kind of men that are presenting themselves for examination. Men who are totally unqualified for dental practice seek endorsement, but all such have been refused, and during the past seven years the Pennsylvania Board has not passed an unworthy applicant. The examination has grown more rigid each year, and we hope the day is not far distant when every man who presents himself for practice in our State shall possess a proper diploma, and that this diploma shall be endorsed by the State Examining Board. I heartily agree with the sentiment that the business of the college is to teach, and I think that the examination of the students, as they come up year by year, should be made by some other authority than the faculty of the college; that there should be a competent board into which no professional or secular politics could intrude, in any way whatever. It would surprise you to learn the intrigues and various unwarranted means that these men who come before an examining board employ, that they may obtain the coveted certificate.

I would like to say, further, that the Examining Board of the State of Pennsylvania has been in a high degree beneficial to the dental colleges. We have been instrumental in sending many men to college who would otherwise never have gone there; and I repeat, that we hope the day is not far distant when every man in Pennsylvania who desires to practice dentistry will have a diploma from a college, and when the time required to complete the necessary studies will be, not three years, but four years, and that each term shall consist of, not five months, but at least nine months of each year.

Dr. W. W. Coon, Alfred, N. Y.: The idea that the examining board should take from the colleges the right to give the privilege to practice, it seems to me, is wrong, because the college faculty is the most competent. But to make everything above suspicion, why not have the examination conducted by the college faculty openly, representatives of the profession being present? How could there be any dissatisfaction if stenographic reporters were at hand, and everything published? There would then be a permanent record of everything done.

Dr. J. Taft, Cincinnati: I had hoped to remain quiet on this occasion, but this is a very absorbing question; one in which all dentists are interested, and one in which all who have had anything to do in educational matters are especially concerned. It is a matter, too, which nearly touches those who occupy the position of Dental Examiners. Various opinions are entertained on this subject, as have been illustrated this afternoon. However, you are not so diverse in expression as has appeared on other occasions. I think a fair understanding of the whole question, and all that pertains to it, would well nigh set at rest the varying minds of those most concerned.

It has been stated in the leading paper read that the colleges are established, organized and maintained, for the purpose of giving instruction to those who desire to assume the responsibilities and work of dental practitioners. That is true. It is also assumed in the paper that their prerogative should go no further than this. That, perhaps, may be an open question. We should remember what dental colleges have done heretofore in recognition of the attainments and eminent services of our best men. It has been thought fit, in the years gone by, to make some recognition of these things, and upon that ground honorary degrees, or diplomas, have been issued to such persons. This has not been an anomalous thing, by any means. Similar institutions have done this thing ever since colleges have been established. Theological institutions do it, and law schools have heretofore conferred honorary degrees. It may be possible that some of them had better not have indulged in this at all. It is liable to abuse, and in dental colleges it undoubtedly has been abused. In this recognition and this proclamation of the attainments of individuals, some, perhaps, have not had sufficient ground for their actions, and perhaps on account of this the practice has been abandoned. Those who did this years ago, had the example of other institutions, older and of more experience, and our young profession was but following their lead. It has undoubtedly been found that from some undue influence, A. B. and C. received this mark of recognition, when the consensus of those who knew them well pronounced that this honor was undeserved. And so, as time went on, it was determined that the granting of honorary degrees by dental schools should cease, and the practice has been virtually abandoned, and now no honorary degree can be granted by any institution except by the means specified in the paper — by the concurrence and consent of all the faculties represented in the Association.

A great many criticisms have been made upon examining boards. These boards have had a pretty hard row to hoe during the last eight or ten years. Nearly forty years ago the first legal enactments were passed regulating the practice of dentistry, with a view of securing men better prepared for their duties than could then be found. These laws were exceedingly elementary in the beginning, falling far short of what they ought to have been, or what they are today. They have been improved upon from time to time.

How should these laws be executed? Who was to be charged with seeing that they were obeyed? For that purpose boards of examiners were provided for in these laws. The method of their appointment has been different in different States. Some have been appointed by the State Society provided for in the law, some by the Executive of the State, as provided for in the law, some through the co-operation of the State Society and the Chief Executive of the State. We should remember that these boards are officers of the law. They are appointed according to law, and they seek to fulfill their duties under the law, perhaps about as well as any other officer or official person acting under the law. They have considerable power in deciding as to the attainments of those who come before them for license to practice dentistry. Why these examining boards should not perform their duties honestly and faithfully, in the main, I cannot see. A little friction lately arose between the Board of Examiners and the Association of College Faculties. That was wholly uncalled for. I saw how it came, and regretted that it occurred, and if it had not been for two or three persons who could not see, or did not see, the whole bearing of the question, there would not have been any friction at all. There was no general feeling of dissension between the two bodies. There was no open war declared between them, and at the last meeting the irritation had passed away in the main, and my impression is that it will never occur again. They work in harmony, and every well informed person will see upon a survey of the field that these two bodies are laboring together for the attainment of the same object, the elevation of our profession, and for shutting out of practice the professional men who are not properly prepared for their work. They should work, and I think they henceforth will work, concurrently for each other.

Nobody denies that the passing of dental laws has vastly improved colleges. It has sent into them hundreds and hundreds of men to prepare themselves for the practice of their profession, who never would have otherwise gone.

It has, moreover, elevated the standard of admission to practice. The boards have, in many instances, especially in Pennsylvania, established a higher standard for admission than is required by many of our colleges. This has had its effect in raising the standard of the schools, for they can not afford to be below the standard required by the Board of Examiners. In this way they have operated concurrently, and for the common end and common interest, and there is no reason why there should be antagonism between these two forces. They are one and the same, reaching to the same end, and we should encourage and strengthen them, and hold up the hands of both, making them better and better until they attain the highest point possible, and fulfill the utmost expectations of the best in dentistry.

Dr. BARRETT (closing the discussion): I do not wish to be understood as opposed to examining boards. I believe they are a necessity, and that they have an important function. But some of them, or of their members, have been arbitrary and imperious. I will not single out any examining board, or member of one, and charge him with this fault, but instances will spring to the recollection of those who have kept watch of this matter, in which the proper limit of authority has been exceeded. We know that there are colleges that in the past have been derelict to duty. But there have always been a faithful few who have not bowed their knee to the Baal of popularity, nor passed through the fire to the

Moloch of pecuniary greed. They have been instant in season and out of season, and what has been the result? The standard has been raised, and if it keeps on for a year or two longer, it will get out of the reach of the profession.

The trouble with some of the discriminating boards is that they don't discriminate. They make no distinction between the good, the indifferent and the bad colleges. I am referring to State Boards which make their examination compulsory, whether the proponent be a graduate, or whether he be not. I think the examining boards should go behind the returns; should examine the equipment and methods of the schools, and place their stamp of approval where they find that they are faithful to the requirements. Once having approved a college, just as long as it maintains its high position I would have its diplomas acknowleged as a qualification for practice.

But there seems to be a misunderstanding of the scope of the colleges. I cannot conceive that a school can discriminate between brains. Some men will not make good diagnosticians or good practitioners. A school cannot give mental capacity or mechanical ability. Professors cannot tell whether anything is lacking until they have had a chance to watch the student, and to test his capabilities. By that time it is too late, for the student once matriculated he cannot be dismissed until the time for which he has virtually contracted has expired. If then the pupil has fulfilled his part of the contract, and can pass his examination, he must receive his diploma.

In this State, the medical profession has secured the passage of a law which provides for the appointment of a board before which the students of all the medical schools in the State must appear for examination, and this board alone has power to confer degrees. A school is pecuniarily and otherwise interested in the graduation of its students, and its standard may be too low; but a competent graduating board will not be swayed by the considerations that might move the most honest college faculty in the world.

Let it not be forgotten that every charge against the college faculties *must* be a charge of dishonesty. Their knowledge and daily experience with students, and in teaching, exonerates them from any possible accusation of incompetence. It is freely insinuated — there is not one within the sound of my voice who has not repeatedly heard the charge made — that teachers are in the schools for the money there is in it, and that they do not care what the student does or does not know, so long as they get their fees. This is unjust and discreditable. Teachers are no more dishonest or unscrupulous than any other class in the community. Take them as a whole, and they are a very respectable body. At any rate, they are not only dentists, but they stand for representative interests in dentistry. Any reflection cast upon them must reflect upon the whole profession. If we are to be respected, we must respect ourselves. Teachers are no more rapacious than any other class of dentists.

Prof. Taft speaks approvingly of the recognition of eminent attainments by the conferring of honorary degrees. Therein is found the essence of the whole matter. What authority have schools to recognize merit, any more than any other body? A diploma should be a certificate of study, and it is a fraud when it represents anything else. The Delavan diplomas were what Prof. Taft approves—"marks of recognition of eminent services." The whole system of conferring diplomas as marks of honor is wrong. True, it exists, and has long existed; but so have measles and bum-bailiffs. This pronouncing upon who is and who is not entitled to honor is as foreign to the province of the schools as was the Pope's bull against the comet foreign to religion. A college diploma is a certificate of study—or it ought to be—and the man who has not pursued the curriculum of study of the school is no more entitled to it than he is to the tail of the monkey.

I am as ready as any man to acknowledge my indebtedness to the workers in the fields of dental science. But I would not have it take the form of a diploma that is a lie upon the face of it, and that can be but a pretence at best. Create a new degree, if necessary, for this special purpose, and let it be one of honor and not dishonor—a degree that does not pretend to mark the completion of a course of study that has never been pursued.

Examining boards have their proper functions, but they are not those of the schools. Colleges have their functions, but they are not the conferring of diplomas. Examining boards should examine, investigate, inspect; not dictate, command, or decree. Teachers should teach, and not assume to pass judgment upon those who are beyond their jurisdiction. It is for neither party to attempt arbitrarily to rule the other, or to assume imperial prerogatives and to set themselves up as governors of their peers and vice-regents in dentistry. Let each stick to its proper sphere, and there will be no trouble.

Dr. L. R. LEACH, Hamburgh, N. Y.: I would like to ask Dr. Barrett what is the function of the Examining Board in this State. Must all graduates of dental colleges come before it for their degree?

Dr. BARRETT: The New York State Degree of Master of Dental Surgery is something quite unique and by itself. It does not pretend to represent any school curriculum at all. It was established in the early days of legal enactments, to enable men who were without a college diploma, and who yet desired to comply with the law, to obtain what the latter pronounced a proper qualification for dental practice. You should remember that our State law, passed nearly a quarter of a century since, was at first not mandatory, but merely advisory. The degree of Master of Dental Surgery was established to give the men of whom I have spoken an opportunity to obtain the only diploma that was within their reach. But it is subject to a number of fatal objections. It is a degree conferred by a non-teaching Board. It is entirely local, being confined to New York State. It destroys the harmony that should exist among the various Examining Boards, and isolates our State Society for assuming functions that the others are not willing to concede. It is not recognized by either the colleges or the profession generally, and leads to confusion in educational matters. It has served an excellent purpose in the past, but I think has outlived its usefulness, and should be abandoned. It is an honorary degree, conferred upon a mere examination, but it does not, like most honorary degrees, make a pretence of representing a course of study that has never been pursued.

The New York State law requires the diploma of a college *recognized as reputable by the State Dental Society*, or the possession of the State dental diploma, conferred, not by the Board of Examiners, but by the State Society itself.

A college once being recognized as reputable, its diploma becomes a legal qualification for practice, but the State Society may at any time strike from the list of recognized schools the name of any one that shall no longer be worthy such recognition, when its diploma will no longer be a sufficient qualification. No man could ever practice in this State upon the diploma of any such college as that which made a pretence of existence at Delavan, Wisconsin. Our law investigates the schools, but once having admitted the efficiency of any one of them, it does not send around a smelling committee to scrutinize each diploma that it issues.

NOTE.—It was proposed to publish in this number of THE DENTAL PRACTITIONER AND ADVERTISER the full proceedings of the Union Meeting, provided that it received them complete and officially. The fact that neither of these conditions could well be complied with, and that such a course would necessarily cause the exclusion of everything else, is the reason for the division of the matter and the conclusion of the report in the next number.

The paper of Dr. Palmer was selected for presentation because it is a continuation of the one printed in the last number. That of Dr. Barrett, because the subject matter is now being considerably discussed in the journals, and it was desirable to present it before it becomes trite.

The annual dinner was given at the Iroquois Hotel, on Wednesday evening, and was an unusually brilliant affair.

The clinics were held at the rooms of the Buffalo Dental Manufacturing Company, on Wednesday morning. A number of new and ingenious appliances were exhibited, but as it has been impossible to obtain a complete list of them, or a clear account of the operations performed, we will not run the risk of a charge of partiality by presenting an imperfect report.—[EDITOR.

THE HUMAN MOUTH AS A FOCUS OF INFECTION.

An Abstract from Dr. Miller's latest papers.—Prepared expressly for this journal.

In the last number of this journal there was published a list of the diseases of the human body which have been traced to the action of mouth-bacteria. This was a condensation of the first of a series of articles in the *Dental Cosmos*, by Dr. W. D. Miller, upon oral bacteriology. The article is continued in the October and November numbers of the *Cosmos*, and is the most exhaustive and complete monograph that has yet appeared upon this subject.

The author, in the second part, proceeds to give a list of the pathogenic, or disease-producing organisms, that have been cultivated on artificial media by different bacteriologists. The article is illustrated by plates showing the appearance of the different organisms, and of the tissues as affected by them. Nothing exceeding these in clearness has yet appeared in our journals. The list of pathogenic bacteria includes twenty-three species, some of which possess pyogenic (pus-producing) properties. A part of these are found in all human mouths, both in health and disease. More of them are seen only in diseased conditions, as in croupous pneumonia, putrid bronchitis, thrush, ulcers, etc. Some are peculiar to carious teeth, and gangrenous tooth pulps. A number of these have been first described by Miller.

The author has performed many experiments to determine the nature and character of the diseases produced by the inoculation of mice, guinea-pigs, dogs, and other animals, with pure cultivations of these organisms. Their effects vary somewhat with the animal infected. Some prove fatal to mice, while dogs are not affected. Others are pathogenic to rabbits, while guinea-pigs possess immunity. In animals infected by some organisms the bacilli are found in the blood in great numbers, while others produce death by peritonitis, the peritoneal cavity being perhaps completely filled with pus, while none of the organisms are found in the blood. In some cases death resulted in a few hours, while in others the animal continued to live for many days, afflicted with ulcers and exhaustive diarrhœa.

The author divides the pathogenic mouth-bacteria into two classes. First, those inducing speedy death through blood-poisoning, with comparatively little local reaction. Secondly, those which produce fatal abscesses at the point of infection. Usually, inoculation from the blood or peritoneal exudation of a diseased animal produced the same results as injections of the saliva. But a drop of human saliva containing any of the pathogenic, or disease-producing organisms, was the common method of infection. A drop of such saliva injected into the peritoneal cavity of a mouse, was in one instance followed by extensive œdema, or swelling of the cheeks, lips and tongue, so that the animal looked as if it was suffering from alveolar abscess on both sides of the jaw.

The author proceeds to consider each of the organisms named separately, noting its appearance in pure cultures, and its specific effect on animals infected by it. He says that it is a well established fact that immunity to infection may be conferred upon animals, by inoculating them with septic material which has been so far weakened in its virulence that the animal, while sickened, finally recovers. In such cases a subsequent infection, even with a virulent full-strength culture, is harmless. This, of course, explains why vaccination with cow-pox virus gives immunity to infection with that of small-pox.

Miller performed many very interesting experiments to determine the extent of this exemption. Dogs, for instance, are not affected by inoculation of the micrococcus of sputum septicæmia, while mice are peculiarly liable to it. He injected blood from the arteries of a dog into the abdominal cavity of mice, to determine if it would confer immunity, but found only negative results. He fed mice upon food that did not furnish a suitable culture media for the coccus, that is, in which outside the body it would not grow, but without favorable effects. He tried a large number of antiseptic solutions, which were injected into mice at the same time with, or subsequently to the infection, but with no certain results. Sometimes the death of the animal was retarded, and sometimes apparently hastened. The only substance that offered anything positive in its effects, was a one per cent. solution of trichloride of iodine, when in most instances the mouse survived, although it lost a piece of skin at the point of infection as large as a finger nail.

The case of a young dentist is cited, who was wounded in the ball of the thumb by a bur with which he was boring out the pulp-chamber of a diseased tooth. The wound was followed by local suppuration and swelling of the axillary glands. Abscesses in different parts of the body supervened, until no less than one hundred and thirty-five had appeared. In the pus from one of these, Miller found a bacillus which he subsequently met in the saliva of healthy persons. Three rabbits were inoculated with a pure culture of the organism, and all died in from fifteen to forty-five hours. Mice and guinea-pigs were also poisoned by it.

The final paper of the series is devoted to prophylactic, or preventive measures. The fact that pathogenic bacteria are found in nearly every human mouth, demands the strictest observance of antiseptic precautions in all operations in the oral cavity. Not only should all instruments, napkins, etc., be kept scrupulously free from germs, but as far as possible the field to be operated upon should be freed from infectious matter. Much may be gained on the part of the patient by the proper use of the tooth-brush, tooth-pick and floss silk. But even the most careful mechanical cleaning will not rid the mouth of bacteria. Only a small proportion of our patients know how to use even so simple an implement as the brush, in the most effective way. It is the duty of the dentist to instruct them in this particular.

An antiseptic mouth-wash, that shall have an agreeable taste and smell, which shall exert no deleterious influence upon the tissues of the mouth, and which shall at the same time be sufficiently powerful and rapid in its action to destroy the bacteria of the mouth, or at least to limit their destructive action, is something that is very much needed. But the task of finding such an one is the most difficult with which we have to deal in the hygiene of the mouth. Not one of the numberless mouth-washes with which the market is flooded makes even an approach toward accomplishing this end. Physicians are in the habit of prescribing borax, boracic acid, permanganate of potash, chlorate of potash, lime-water, salycilic acid and other like preparations for disinfecting the mouth, in stomatitis, diphtheria, gangrene and other diseased conditions, but with the exception of salycilic acid, they have almost no effect whatever upon the bacteria which may be sources of infection.

To determine the efficiency of the various agents, it is necessary to test their action in the mouth itself, and not upon pure cultures of the organisms. The author has found that a mixture of sublimate and benzoic acid, which completely sterilized a pure culture of streptococci in one minute, required five times as long to render innocuous an equal quantity of saliva.

To test various solutions, the mouth is rinsed for about ten seconds with the antiseptic in proper strength, and the fluid evacuated into a sterilized glass vessel. Tubes of bouillon are then infected with drops of this, and the results noted. The strength in which antiseptics may be used in the mouth was found to be about as follows:

Sublimate (Merc. Chloride)	1:2000	Thallium Sulphur	1:1000
Trichloride of Iodine	1:2000	Saccharine	1:400
Benzoic Acid	1:300	Soluble Saccharine	1:120
Salycilic Acid	1:300	Oil Eucalyptus	1:625
Hydronapthol	1:1500	Eugenol	1:750
Beta Napthol	1:1300	Oil Cinnamon	1:400
Lysol	1:200	Oil Cloves	1:550
Carbolic Acid	1:100	Oil Latch	1:360
Boric Acid	1:50	Oil Wintergreen	1:350
Zinc Sulphocarbolate	1:250	Oil Peppermint	1:600
Liq. Alumin. Acet.	1:20	Chlorate of Potash	1:40
Thymol	1:2000	Permanganate of Potash	1:2500
Peroxide of Hydrogen	2–4:100		

Of these preparations only the mercuric chloride, trichloride of iodine, benzoic acid, salycilic acid, and an alcoholic solution of saccharine, give any definitely favorable results. Of these, the sublimate solution presents the objection of its disagreeable taste, and its possible poisonous action upon the general system, if persisted in for any considerable length of time; trichloride of iodine and salycilic acid are limited in use because of their acid reaction. There remain, therefore, only benzoic acid .and saccharine, from which to construct an antiseptic mouth-wash that can be safely used for any length of time. Peroxide of hydrogen, on account of its non-poisonous and non-irritating qualities, may, however, be left longer in the mouth than the great majority of antiseptic liquids, and the added time may make it effective, and thus perhaps add it to the list.

For the last year Miller has been experimenting with saccharine, and has found that it exerts a considerable action upon bacteria of the mouth. It also appears to be one of the least poisonous substances recommended, and has no deleterious action upon the teeth. Its intense sweetness, however—a sweetness not that of sugar—renders it very unpleasant to some people. He has used it in the following formula:

℞—Saccharine	2.5
Acid Benzoic	3.
Tinct. Ratantiæ	15.
Alcohol Abs.	100.
Ol. Menth. Pip.	0.50
Ol. Cinnamon	0.50

A formula which Miller recommended some years since, and which has produced good results, is as follows:

℞—Acid Benzoic	3.
Tinct. Eucalypti	15.
Alcohol	100.
Ol. Menth. Pip.	0.75

The saccharine solution is used, three parts to twenty-seven of water. If in place of the water a four per cent. solution of peroxide of hydrogen is used, still more striking results are obtained. With these formulæ, and with a sublimate-benzoic solution, very many tests were made, with the result of most materially reducing the number of bacteria in the mouth.

In diseased conditions in which pathogenic bacteria were found, the saccharine mouth-wash proved very efficacious. Mice infected with saliva from such persons, obtained after the use of the preparation, remained unaffected, while those infected with the saliva before the use of the solution, invariably died in from fifteen to thirty-six hours. But the the wash failed to produce the desired action upon the pyogenic (pus-producing) bacteria.

The experiments of Miller are intensely interesting to every dental student, and should be carefully studied. But the results indicate that the desired antiseptic mouth-wash has not yet been produced, though much progress has been made in this direction. The secret will yet be wrested from nature, for such exhaustive studies as those of Dr. Miller will soon cover the whole ground.

SOME EXPERIMENTS ON THE PROPERTIES OF AMALGAMS.

Abstract of a Paper by Amos Kirby, L. D. S., before the British Dental Association. Prepared expressly for this journal.

Up to the time of Charles Tomes' experiments, nothing definite was known concerning the crystallization of amalgams. It was asserted on the one hand that they contracted very considerably, and on the other that they expanded so much as frequently to cause the splitting asunder of a strong walled tooth. To clear up the matter with scientific accuracy, experiments were inaugurated by Mr. Tomes, who proceeded to determine the specific gravity of masses of recently mixed amalgam, repeating the process as the piece became finally hardened.

One of my first experiments consisted in introducing amalgam paste into a bit of glass tube, open at both its ends, one of which was held against the finger while the substance was packed into it. This method gave a decided tendency to contraction in some of the alloys in common use, as the mass could be easily shaken out soon after the filling became hard.

A piece of glass tube was next closed at one end, so as to represent a rather deep tooth cavity of moderate size, a large one being rejected as introducing possible sources of error. This was filled with amalgam formed from precipitated silver, which was smoothed off level with the orifice of the tube, in the hope that a magnifying glass would show if any expansion or contraction took place. It was examined in a few hours, and the projection found to be so great that no glass was required to show it. The surface was then ground off level with the glass, and it was laid by until the following morning, when expansion had again taken place, apparently to as great an extent as before. After another grinding some further expansion was noticeable, but to a much smaller extent.

Although the expansion was so great, it did not cause the splitting of the tube, which, although it was not very thick, seemed to have controlled the direction in which it took place, and produced what appeared to be a flowing from the orifice. Some tubes of the same metal, which were afterwards made, split in two in the course of a few days, and others after a longer time.

In my own hands, silver amalgams, whether prepared with filed or precipitated metal, never failed to expand in a remarkable degree, in whatever way they were tested. Some specific gravity tests made by another, however, appear to point to considerable contraction, but in these as small a proportion of mercury was used as would barely make a paste. This undoubtedly allowed a certain amount of air to be enclosed in the mass, which would escape during the long time that the tubes were allowed to remain in water, the result being an apparent diminution in the bulk of the amalgam.

As the evidences of this were so unmistakable, other metals, or alloys of metals, in different proportions, were placed in similar tubes, in the hope that they would act in a similar way, but none of them altered in bulk sufficiently for the change to be seen, even with the help of a magnifying glass. When they were first placed in the tubes they appeared to be well in contact with the glass, which presented an almost mirror-like appearance, but after they had been hardened for some time their upper thirds became slightly dull. After some days they were put into liquid dye, which was contained in a small cup that screwed into the lower end of a syringe. The piston of this was then drawn up and held in that position for a short time, which, of course, had the effect to produce a partial vacuum. When air was re-admitted, it was found that the coloring fluid had been forced between the filling and the glass, to about half the length of the tubes, as well as into some of the capillary spaces. This showed how severe had been the test, and proved conclusively that the lower part of the filling was still in positive contact with the glass, however much the upper part had shrunk away from it. After a further time the shrinkage in the upper portions of the amalgams increased, until with some of them the mass took almost the shape of a cylinder, the upper third of which was a truncated cone. The shrinkage is greatest at the upper part, and becomes less lower down. It suggests, and indeed represents, the spheroidal form sometimes seen in fillings, but which exists only in the upper or exposed end.

But while these experiments showed that there was a change in amalgam masses during the process of crystallization, they did not indicate its exact character, and a new series was entered upon to determine what these were. That which gave the most definite conclusion was performed with an apparatus that consisted of a V-shaped trough, one end being stopped permanently, and the other by a movable bar, to which was attached a micrometer screw for the purpose of measuring the amount of expansion or contraction. The trough was to be filled with a series of different alloys, packed in firmly and smoothed and leveled even with the top of the trough. The exact length was to be measured by the vernier and screw, and when the amalgam was set it was to be marked and removed to afford room for another. All that was then necessary to determine the expansion and contraction, would be to replace and re-measure the different bars.

But upon attempting to replace the amalgam it was found that the bars no longer fitted the trough. It was not chiefly as to length that the most significant changes had taken place, but the bars were sprung, each end having been slightly bent upwards. In the course of a few days this bending was increased, until there was a marked curvature in every one of them, proving that the tendency was inherent in and common to all amalgams.

In some cases of unalloyed single metals, like palladium, a few bars showed a tendency to straighten again, after having first assumed the curvature, but no such effects were observed in any single metals or alloys that were suitable for filling teeth.

Here was a phenomenon that was at first inexplicable, and that seemed to be sufficient to account for the notorious uncertainty of amalgam fillings. Careful reflection led to the belief that it might be due to an unequal distribution of mercury throughout the mass, the tendency of the upper portion of an amalgam filling to become soft under the necessary manipulation being a familiar one. As the mercury was a mere solvent for the other metals, and did not enter into chemical union with them, why might it not, when in excess, make its way through the mass to other parts, where it was present in less quantity, and thus tend to make the mass homogeneous? Water would certainly do so if it were the solvent, and evaporation were prevented. Why should not mercury follow the same rule? If this transfer actually did take place, the part at the orifice of the cavity, which contained the most mercury, would lose the most during this process; the next portion below would lose less, and there would be a tendency towards the "spheroidal" form.

As the lower part of the mass took mercury from the upper, it would increase in size, and force the upper part of the stopping outwards in a line with the axis of the cavity. There would thus be a contraction laterally at the top of the filling, and a drawing away from the walls of the tooth, and at the same time an expansion of the bottom of the filling, which must be manifested toward the surface, and thus there would be a protrusion at the orifice. The bending of the bars in the micrometer trough differed from this only through the conditions under which the contraction and expansion took place.

To determine if this transfer of mercury was a practical as well as a theoretical fact, amalgam was introduced into a split tube, so as to form a long cylinder, the surplus mercury which was brought to the surface in manipulation being thus left at one end. As soon as it was set the piece was divided in the middle, and the two ends made to weigh exactly the same, by cutting off from the central part of the heavier portion and adding it to the other. The whole of the mercury was then driven off by heat, and the pieces weighed again, when it was found that one end had contained some grains more mercury than the other.

Another cylinder was then made in exactly the same way, but instead of being cut in two parts, it was suffered to remain undivided for seventeen days, to allow time for any possible distribution of the mercury.

The cylinder was then divided and treated precisely as the other one had been, when upon weighing it was found that each had lost almost exactly the same amount, thus leaving no doubt that a transfer of mercury had taken place in the latter instance.

Experiments were performed in the same manner with soft amalgam, and with those which were mixed exceedingly dry, but it was found that in the latter case the bars were bent much more than in the former.

The cause of the flexion having been found, it now remained to determine the remedy, and this of course must be accomplished by means to bring about an equal distribution of mercury through the mass when the filling was finished. As the excess of mercury at the surface could not well be prevented, and as a very dry amalgam produced the worst results, it was evident that it must be got rid of by absorbing it with a quantity of material containing but a small proportion of mercury. Different experiments were performed, such as "wafering," the taking up of the surplus with tin foil, etc., but all were unsatisfactory. The plan finally adopted was to make the first part of the filling of very soft amalgam—one containing nearly as much mercury by weight as filings—and the remainder (as much as one-third of the cavity) of a very much dryer compound, or one containing at least twice as much filings as mercury. Then, if the manipulations were adapted to the difference in the two parts, the surplus mercury would be brought to the surface and a homogeneous mass insured at the outset, which would prevent transfer of the mercury, and the consequent expansion of one part and the contraction of the other. By following this plan it was easy to make bars that were straight, and that could be measured by the micrometer, and fillings which fitted accurately to the walls of glass tubes, and therefore to the cavities of teeth.

But it was found that a very delicate balance was needed accurately to determine the relative proportions of mercury and filings in the different parts of the filling, since a discrepancy too small to be indicated by a balance that would not turn with a very small fraction of a grain, was large enough to make a considerable difference in the whole mass.

In experimenting with different substances, it was found that although there was a total expansion in some cases, it did not prevent the fatal shrinking at the edge, caused by the unequal distribution of the mercury.

A great source of trouble and error in the early experiments arose from the fact that fillings prepared from newly melted alloys require two or three times as much mercury to make them into a plastic amalgam as those which have been for some time cut up, while the mass sets so rapidly that it is very difficult of manipulation.

NAUSEA AND VOMITING AFTER THE EMPLOYMENT OF ETHER AS AN ANÆSTHETIC.

(The following correspondence will explain itself.—EDITOR.)

LAURENCE TURNBULL, M. D., P. H. G.,

Dear Sir—I desire to ask of you a question, the answer to which will be of great service to me personally, and I think might benefit some general practitioners of my acquaintance, for the annoyance that I have met is not confined to the practice of dentistry.

I was so fortunate as to be one of a number of gentlemen in the graduating class at the Philadelphia Dental College last spring, and had the honor of appearing before you in the examination for the "Special Certificate" in anæsthesia and anæsthetics. Being not unlike the average graduate from dental schools, I fail to remember all I then saw and learned. Therefore, I am forced now to seek for the information I ought still to possess.

I am meeting with cases of nausea and vomiting after giving ether for the extraction of teeth, especially when adhering to Dr. Dorr's rule of not giving water to patients. My impression is that you recommended the administration of one-hundredth of a grain of strychnia before giving the anæsthetic, to obviate this tendency. Will you please inform me if I am correct, and if you do recommend this as a preventive? I cannot find any reference to it in your latest book.

Yours respectfully,

CHAS. S. BRAGDON, D. D. S.

(ANSWER.)

C. S. BRAGDON, D. D. S.,

Dear Sir—You are quite right concerning my recommendation of strychnia as a preventive of nausea in ether narcosis. I do so employ it in the Aural Clinic of Jefferson Medical College. I also use in conjunction with it bromide of potassium, or sodium, 30 grains in solution. This is my practice, especially in the class of patients who habitually use stimulants freely, or who suffer from nervous difficulties. But I am surprised that you do not use fresh nitrous oxide gas exclusively in cases of extraction.

You did not examine my "Manual of Anæsthetics," Third Edition, 1890, with care, or you would have found an exhaustive article on Nausea and Vomiting after the use of anæsthetics in operations.

Very truly yours,

LAURENCE TURNBULL.

THE DENTAL PRACTITIONER
AND ADVERTISER.

DR. W. C. BARRETT, ... EDITOR.

BUFFALO, N. Y., JANUARY, 1892.

SALUTATORY.

The advent of a new editor for this journal is not an event that will induce any convulsive throes of nature. And yet, it is not without a certain amount of interest for those who are its readers. For two-and-twenty years it has been conducted by one man, until it had become so identified with his personality that it seemed as if Dr. Lewis *was* the DENTAL ADVERTISER. New duties have forced him to relinquish the position that he has so long held with credit to himself and profit to the profession, and another must step in and perhaps reap what he has so well sown.

What little of novelty there might have been in the announcement, has been discounted by the publicity given to the fact in a former number. The most of the writer's good-natured contemporaries have commented upon it, so far as they thought it worthy their attention, and on the whole have let him down rather easily into the chair editorial. There were so many bad things that might easily have been said of him, that he has rather a feeling of gratitude toward those who have said nothing—perhaps because they had nothing good to say. Not that the writer imagines there are any who wish him ill, for in a journalistic experience of a considerable number of years he is not aware that he earned the enmity of one of his compeers, although his propensity to speak abruptly at times was not always curbed as it should have been. But whatever of comment on current events he has felt called upon to make in the past, there has never been in it anything of a spirit of personal bitterness, and there never will be, until what little of the milk of human kindness he possesses shall have finally curdled completely.

Brothers of the Editorial Fraternity, accept me once more into your number, even though it be to but an humble place, and when I prove unworthy the company to which I have aspired, cast me out without mercy and without appeal. But I pray you, do not mistake any undue zeal with which I may be afflicted for malignity or malevolence.

And now, what shall the present writer say to the readers? He can but pledge to them his best efforts in their behalf. This journal will never be the organ of any man, or of any set of men, while he conducts it. It will be pledged to nothing, save what it believes to be for the best interests of dentists and dentistry. The new editor is aware that he is a little out of place unless acting with the opposition. He can run passably well if he is given his head, but if a harness were put upon him he would be hung in the breeching before he had gone a hundred yards. If any other man joins his church he is apt to secede at once.—Perhaps that is expressing it rather strongly, for he does not intend to be impracticable or discordant. But when he finds himself joined by all the rest of the world, he likes to move on to another claim. It is no satisfaction to him to bark in the general chorus, and so when "Tray, Blanche and Sweetheart" open up, he is quite apt to find another scent and to start an independent hunt.

This is not paraded as a virtue. It may not be altogether a vice. But a rather intimate acquaintance with himself for more years than he likes to reckon up—years that should have brought with them more of wisdom—have taught the writer that these are some of his ineradicable traits, and the readers of this journal must accept him for what he is, and not for what they would have him. Perhaps there may be something of good in him, if it be searched for long and carefully enough. Of one thing the reader may be assured. Be it for good or bad, THE PRACTITIONER will be original; it will not attempt to form itself upon any model. It will have its own opinions, and will stand up for them stoutly, but it will not refuse to make acknowledgment when in the wrong——if any one can convince it that it is in the wrong.

It will not neglect the practical, by any means, but it will not be a journal of recipes and specifics. It will try to consider basal principles, and the scientific laws upon which all good practice must be founded. It will quote whatever is found that it believes will be of interest to the practitioner, but it will not be like Hamlet's uncle, a thing of shreds and patches. It will aim to be an educator, and to lead up to higher views and a better practice.

The ambition of the new editor is to make of it a kind of Dental Review—it is a thousand pities that another and a better journal has pre-empted the name—and to present with each number a kind of epitome of what is taking place in the dental world. Not in the matter of local happenings and professional gossip, for the journal will aim at something higher than that, but to call attention to new discoveries in dental science and art, to comment upon and to criticise if need be enunciations of principles, to carefully review important papers and books wherever published, to collate intelligent opinions wherever expressed, to point out scientific or professional error wherever found, and thus to keep its readers thoroughly informed concerning professional progress. This is not accomplished in the present number; it may never be attained, but the end will be kept steadily in view, and perhaps advancement in this direction may be made in the near future. In the meantime, the journal will, if possible, be made worthy the attention of dentists, for the undersigned really has an honest and earnest desire to be of some service to the profession which he loves above all immaterial earthly things, and to gain the goodwill of those whose approbation he values above that of any other class of men living.

W. C. BARRETT.

"THERE IS DEATH IN THE POT."

Some men die natural deaths, some achieve destruction, and some miss it through no fault of their own. Among the latter class are those dentists who purposely, and of malice aforethought, permanently close up the blow-off valves in their vulcanizers. If there is any one idiot who deserves everlasting discouragement, it is he who drives the point of an excavator into the opening left by the manufacturer to secure his own safety. Not necessarily because he thereby takes the chance of blowing out his own small modicum of brains, but because he imperils the lives of those who are innocent of his crime.

What would be thought of the engineer who would chain down the safety-valve of his boilers? The western steamboat man who hung a monkey-wrench upon the bar, has passed into a proverb of recklessness. But not infrequently the dentist, who is in charge of a boiler of copper that will restrain pressure to a much more dangerous point, will obliterate his safety valve altogether, trusting solely to a thermometer notoriously unreliable, and will complacently stand upon the brink of eternity, waiting for the explosion that must inevitably come sooner or later. He is infinitely less excusable than the didn't-know-it-was-loaded zany, who snaps a pistol at his neighbor's head, for he knows it *is* loaded.

Are we stating the matter too strongly? The calm-blooded reader would not think so if he could see the condition of some of the vulcanizers sent to the manufacturers for repairs. Strained, twisted, contorted, with swollen, protruded sides, held together only by the perfection of the workmanship, it makes one shudder to think of the terrible risks incurred in handling these magazines of death, with the only avenue of safety irrevocably stopped. Do dentists imagine that the safety-valve is inserted in the vulcanizer for an ornament, or do they believe it is put in merely to annoy the laboratory assistant by blowing out? The very fact that it does not stay, is an indication that the thermometer is out of order and can no longer be relied upon—that the machine cannot do perfect work, and should go to the manufacturer for repairs.

But if dentists will be reckless with an instrument that is not made subject to their carelessness, what shall be said of one that seems to invite a catastrophe? There is advertised and upon the market an appliance, intended to take the place of the safety-apparatus, that has a two-way cock, which needs only to be inadvertently turned wrong, when it as effectually seals up the safety valve as though the end of an excavator were driven into it. The best of us are liable to moments of carelessness, and such an appliance is unfit to be committed to the care of either the young assistant or the more experienced dentist.

It is the duty of every one who owns a vulcanizer to see that it is properly provided with a perfect safety valve, no matter whether any other kind of blow-off is used or not, and to carefully guard its integrity, remembering that it is the securest watch that can be placed over what may easily become one of the most destructive of engines.

FITTING BANDS.

Every crown-worker has his own method of fitting a gold band around the root of a tooth, and we do not pretend to be an exception to the rule. The one we are now using is that for which we have abandoned a number of other methods. Perhaps it may not meet the approval of others—and perhaps many others are now using it.

A strip of gold, the proper length and width, is cut and annealed to perfect softness. It is then, with pliers, approximately fitted about the root, and a strong waxed ligature wound about it—usually twice—with a single surgeons' knot placed in it. While the assistant holds the band in place by her finger upon the top of it, the ligature is firmly drawn up. The cervical edge of the band is carefully burnished into place, and the overlapping end pressed down. The ligature is again and again drawn up, until the band is perfect in its adaptation. Then it is finally tied, the band slipped off, grasped by a pair of delicate pliers at the lap, a bit of solder placed on the inside, and it is held in the flame until soldered. The ligature is left to burn off in the flame.

The adapting of the cervical edge of the band to the festoon of the gum may be partially done before the ligature is placed about it, or it may be entirely left until after the soldering is done, according to the necessities of the case.

There is nothing better for ligatures than three-cord, linen machine thread, about No. 30, such as is sold for shoemakers' use. It may be obtained at shoemakers' outfitting establishments.

A DENTAL MUSEUM.

There are few dentists who have not in their possession specimens of great pathological or anatomical interest, which if they were deposited in some public place would be a continual source of instruction. As it is they are of little use to anybody, and after a time, or upon the death of their possessor, they will be lost, or thrown away by some unappreciative heir. It is the duty of every one who has such a specimen to put it in some secure place. The colleges have museums, and are always glad to receive such specimens. A few dental societies have cabinets of collections. Among them is the Eighth District Dental Society of the State of New York. Through the thoughtfulness and care of Dr. S. A. Freeman, of Buffalo, a collection of dental journals was commenced some years ago, and by gifts and exchanges these have grown into an almost complete library of dental journalism.

The society is possessed, also, of a number of beautiful anatomical preparations, illustrating First and Second Dentitions, the Fifth Pair of Nerves, etc., with various charts and models. Its most precious possession is its interest in a collection of the skulls of ancient Mound Builders, obtained from the far Southwest, and which it purchased in connection with the medical men of the city, and the Society of Natural Sciences.

Such collections are certain to be scattered and lost if there be no permanent place for keeping them. The District Society is very fortunate in this respect. The Buffalo Society of Natural Sciences has a large museum, and is a fixed and abidingly established institution. It gave to the Dental Society the privilege of permanently depositing all its collections in the museum, where they have the care of the employés and officers. The Dental Society's property is deposited in a room specially devoted to that purpose, and is under its own control. There is no fear that it will not be allowed to remain there, for the Society of Natural Sciences owes more to dentists than to any other class of men. One of them — the late Dr. George E. Hayes — was President of the Society for some years, and left it what will doubtless amount to one hundred and fifty thousand dollars or more, to endow a school of technology.

Here then is a place where may be established a permanent Museum of Dental Science, if dentists so will. If those of Western New York will contribute such specimens as they may come into possession of, a valuable collection may be got together. Anything illustrating any department of natural history will be welcome, and will be duly acknowledged. What is most desired are fossils — or petrifactions — representing anything in dental science. Fossilized teeth or bones are especially solicited. Skeletons or skulls of different animals, particularly if there be any abnormalities in the teeth, are wanted. Single teeth of the various orders of animals will be gladly received. Fossil or other jaws will be identified, and the species to which the animal belonged will be described.

If the dentists of Western New York alone will give this matter their attention, and take an interest in gathering specimens, they may soon be in possession of a museum that will be unique, and that will prove of value to coming generations. Besides this, dentists everywhere who contribute to it will have the satisfaction of knowing that their valuable specimens will be permanently preserved, and associated with their names, will be on exhibition in a free museum that is visited by many thousands of persons each month.

Specimens may be directed to the Society of Natural Sciences, Dental Department, Library Building, Buffalo, N. Y.

CAPPING PULPS.

It is more amusing than instructive to listen to the discussion in almost any well regulated dental society when the subject of capping pulps arises. The various contradictory methods that are recommended, and the direct conflict of principles involved, are not calculated to impress the man up a tree with an exalted estimate of the scientific status of the disputants. One insists upon the absolute necessity for the use of a cauterant, that the exposed and irritated tissues may be destroyed. Another carefully avoids these agents, because the pellicle thus formed must become a dangerous element. One desires the influence of a moderate irritant, that the pulp may be stimulated to action in depositing secondary dentine, while another insists upon the use of only the very blandest and most soothing applications.

One would place over the exposed point a metallic cap, while another demands a porous covering, that may absorb any effusions from the wounded pulp. One uses a concave disk of some kind, to form a bridge above the breach in the dentinal walls, while another contends for a material that shall be in absolute contact with it.

One will deplete the pulp by bleeding, while another holds up his hands in horror at any willful traumatism. One employs as a covering oxy-phosphate of zinc, because it is a non-irritant; another, oxy-chloride, because it is an irritating stimulant. One uses getta-percha, because it is a non-conductor; another platinum, because it is not. One applies an obtundent to keep it quiet; another deprecates this, because it induces a fatal sleep. One varnishes the exposed point, another dusts it over with some preparation of lime, while yet another whacks in a filling with scarce any protective measures at all. A dentist once took out a patent for covering the pulp with a piece of quill, and retailed out his goose-feather cappings at an extravagant price.

And what is yet more amusing, each of the advocates of these contradictory methods claims to meet with almost universal success. Each is ready to condemn every other method, but he stands up for his own particular fad as almost infallible. If one-tenth of the pulps are really saved that it is claimed are preserved alive, dental practice must either be an awful humbug, or the tooth-pulp is the most enduring of all the notoriously abused organs of the body.

Amid all this contradiction, the impartial spectator referred to, the man up the tree, looks on and wonders when some settled principle will govern the matter; when some intelligent and consistent line of practice will be adopted; when some physiological, or chemical, or empirical law will be discovered, that will be a rule of procedure; when the present hodge-podge of nonsensical nostrums will be abandoned; when it will be found out whether exposed pulps can or cannot be saved, and what reasonable and really scientific method will supply the greatest chance for a favorable result.

COLLEGE WORK.

"The hope of the profession lies very largely in the colleges. Woe be to the college men who do not appreciate the fact that it is a liberal profession, and that for its practice there must be a liberal education. The critics of colleges usually decry theoretical and scientific instruction, and clamor for the practical alone. This has a tendency to tempt college men to cater to that class. They too frequently confine the attention of students to the infirmary, to the exclusion of all that is scientific.

This teaching is fraught with a menace to our profession. Let college men beware of it. Combine the scientific with the practical, but remember that *true practice* must always be the result of *true science.*

It is an easy matter for the teacher to confine himself to the practical alone. To do this needs little preparation. The higher teaching based upon principles calling for an intimate scientific knowledge, requires hours of thought and preparation for each lecture delivered."—*Editorial in Western Dental Journal.*

Read that over again. It is worth it. Then spend a little earnest thought upon the matter. "The critics of colleges usually decry theoretical and scientific instruction, and clamor for the practical alone."

Of course they do. Can the shoemaker rise above his last? The man who is nothing but a mechanic appreciates nothing but mechanics. The educated and intelligent man knows that true mechanics are founded upon scientific laws, and that those laws are determined by theory.

The "Rule of thumb" is scarcely precise enough for the dentist. He should know the reason for that which he does, and what is and what is not in accordance with law. We once saw a dentist endeavoring to raise water out of a cellar by means of a siphon, ignorant of the scientific law that the discharging leg must open at a lower point than the other. That *was* a spectacle for a member of an educated body to offer to the secular world.

That dentist was the most rampant opponent of the higher education of dentists whom we ever knew. He was most intensely practical. "That ain't dentistry," he used to say whenever anyone began to speak of anything but amalgam and red rubber. And what a bitter critic of the colleges he was. How he delighted in relating instances in which he had found recent college graduates who could not pack a rubber plate half as well as he could, with his twenty years of experience. Oh, he was an intense stickler for a *practical* professional education. He believed in making of dental students dentists, and not scientists.

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PYOKTANIN AS AN ANTISEPTIC.

Whenever the conservative dentist or physician sees a remedy unduly vaunted and its virtues extravagantly extolled, he should be extremely careful in his first experiments with it. The chances are ten to one that it will be a disappointment. Many remember what absurd laudations were paid to pyoktanin when it was first heralded to the public. It was the "Pus Killer," and all other antiseptics might be retired at once. We tried the miserable nasty stuff once or twice, and that was sufficient. We discovered that it was a proprietary remedy, that the manufacturers were shrewdly making practitioners do the advertising, and from this they were coining money at the extortionate price at which it was sold.

Dr. Roswell Park, Professor of Surgery in the University of Buffalo, Medical Department, in *Annals of Surgery* gives his experience with it. He says:

> "It cannot be relied upon in cases of surgery except in a strength that is dangerous. As an injection in gonorrhœa, I have had no experience with it, but find that the most of those who have tried it have met with disappointment. Upon granulating surfaces it does appear to be stimulating and to exert a desirable effect, but no more so than other substances within easy reach, and its stain is often undesirable. In ophthalmological practice it appears also to have scarcely come up to the requirements of the day. On the whole, then, it has but few qualities by which we are to commend it above numerous other drugs of its general class, while in all that may answer to the more scrupulous demands of aseptic surgery, it has proved in my hands—as in those of others who have tested it from the purely clinical standpoint—disappointing."

Exit pyoktanin in a blue-red cloud, leaving behind it but a sickening stench and an ineradicable stain.

CONCERNING DIPLOMAS.

"Why is it a dentist of years of practice is required to go through the same course as a beardless boy, fresh from the school room, shop or plow? If there were different ways for an old practitioner to get his diploma, I think a larger number would attend. I have been in practice fifteen years, and would like to be able to attend a short college course and graduate, but I am debarred."—*Dr. Robinson, in Items of Interest.*

Of course you would like to graduate after attending a "short course" in college. There are a great many who would. But what do you think the dental diploma would be worth, if it was given in that way? In what estimation was it held in Europe, when it was conferred after a "short course"? Because you are a practitioner of fifteen years' standing, you think you should graduate upon different terms from the beardless boy. But can you not see that a diploma thus received would be a fraud upon its face, and you, if you flourished it, would be little better? The diploma represents the completion of a special course of study, in a proper school and under the direction of qualified teachers. What has either the beard or the fifteen years' practice to do with that? You want a diploma without the scholastic labor that the boy must give. That diploma stands for something more than the ability to fill a tooth, or to make a rubber plate. When you have gone through the full course of study that the boy has pursued, you will be entitled to it, and not before. If you are an honest man you cannot wish it on any other terms. If you are not—and we do not mean to question your probity—you have missed your opportunity. You should have sent the twelve dollars and received one of the Delavan fraudulent diplomas, when they were offered at that price.

THE JANUARY PRACTITIONER AND ADVERTISER.

This number contains two articles which we hope will not be entirely passed by, inasmuch as they were prepared with considerable labor. They are an epitome of important work done abroad in widely different fields, the record of which has been presented to the world since our last issue. The first of these is a condensation of the latest observations of Professor Miller, and is of course important.

The other is an abstract of the first really new thing that has been said of amalgam in some time. That hackneyed subject has been examined from so many standpoints that it is hard to find a new point of view, and yet here is the record of observations on a different line from those which have preceded it. We shall endeavor to make such condensations of important articles published elsewhere a feature of this journal.

BIBLIOGRAPHICAL.

DENTAL MEDICINE: A MANUAL OF DENTAL MATERIA MEDICA AND THERAPEUTICS. By Ferdinand J. S. Gorgas, A.M., M.D., D.D.S. Fourth Edition. Revised and enlarged. P. Blakiston, Son & Co., Philadelphia, 1891; pp. 524.

When, early in 1884, we were called upon editorially to notice the first edition of Professor Gorgas' work on Dental Medicine we said: "It is an encouraging sign when repeated text-books upon materia medica and therapeutics multiply, for it indicates that dentistry has outgrown the day when it was considered but a mechanic art." But how could we have anticipated that in seven short years the fourth edition of such a work would be demanded, every copy of previous editions having been exhausted? Yet here it is, enlarged so as to include the latest discoveries in dental therapeutics. The book has become, not only a recognized text-book in every dental school in the world, but a necessary feature in the library of every practitioner who makes any pretention to complete practice.

The time has long passed when it was necessary to recommend this book to dental students. Its place in our literature is secure, and the present duty of the critic is to point out any possible deficiencies, and to assist in making it what it aims to be—the standard recognized authority in its special field.

It seems time that we, as dentists, forsook the old beaten paths of medicine and struck out for ourselves. Why, in our special field, should we accept the pathological views of the long ago? Surely there has been sufficient advance all along the line for dentists to begin to think for themselves, and to reject that which their special studies should teach them is false. We take exception, for instance, to the following, found on page 41 of the work under notice:

> "The irritation of teething is indicated by a hot, swollen and tender condition of the gums, fretfulness, irritable temper, refusal of nourishment, fever and thirst, and if not relieved, diarrhœa with offensive motions, sometimes a troublesome cough, convulsions and other serious results."

To our apprehension, here is a decided lack of clearness in symptomatology. The indications of some general disturbance, of stomatitis, and of digestive disorders, are all mingled with derangements of a possible dental origin, so that a clear diagnosis from this description would be extremely difficult. It has been the habit of physicians to attribute to teething the diarrhœas and dysenteries, the fevers and fretfulness, that are the results of injudicious feeding. The advancement of the teeth has long been a convenient makeshift for the incompetent or thoughtless practitioner, who, because diarrhœas occur about the time of the eruption of the teeth, ascribes them to that source, heedless of the fact that it is also the period at which the diet of the child is frequently changed. With almost as much show of reason could the teething be attributed to the diarrhœa.

It matters little that the gastric disturbances may occur when no tooth is anywhere near its normal period for eruption. The infant of six months may be fed on corned-beef and cabbage, and if a diarrhœa occurs it is attributed to the fact that its teeth may be coming, when there is not the first sign of their advancement.

The disturbances incident to teething are necessarily of a nervous character mainly, and the paragraphs succeding the one which we have quoted, if carefully scanned, would seem to recognize this. We would have a book of the great importance of the one under notice clearly point out these facts, and not follow the antiquated teachings of the past.

We could instance what we believe to be confusions in describing other conditions, notably in the chapter on Inflammation, and in the Effects of Micro-organisms, but perhaps we have said enough to indicate our meaning. Each edition of the work has been a distinct advance upon the previous ones, and when, a year or two hence, a fifth is called for, we shall expect to applaud great progress in this particular.

In the meantime, if the reader of this notice does not possess the book he must get it, or acknowledge that he is not fully equipped for his daily duties.

HANDBOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS. By Samuel O. L. Potter, A. M., M. D., M. R. C. P. Third edition. Revised. P. Blakiston, Son & Co., Philadelphia, 1891.

This book, of 767 octavo pages, should stand by the side of Gorgas' Dental Medicine in the library of every dentist. It is a compendium of the essentials of that which is found in the extended treatises of other authors. It is so often that a dentist desires to look into general therapeutics in the study of his cases, that Professor Potter's work admirably supplements that of Professor Gorgas. The chapters on pharmacy are well worth the price of the book. If dentists would study what is said of incompatibles, there would be less of the absurd mixtures that we sometimes see recommended in the journals, in which neutralizing and fixing agents are mingled in the same preparation.

We had marked for extract lists of agents in common use by dentists, which are precipitated by others also frequently employed; of poisonous, and of some explosive compounds, that may readily be formed in the dental laboratory, but space will not permit our giving them. We can only say, get the book and study it, for it will do you good.

TRANSACTIONS OF THE DENTAL SOCIETY OF THE STATE OF NEW YORK FOR 1890 AND 1891. Published by the Society.

Sometimes the proceedings of this Society appear promptly—and sometimes they do not. There is little use in giving them to the world after the lapse of a year, or even of six months. The papers read become antiquated and the debates are stale. They appear too late to have any influence in the decision of professional questions, new matters of interest having succeeded them and attracted general attention. Some of the papers and a part of the discussions in the volume are, however, yet of interest. This is especially true of the minutes of 1891.

The volume is handsomely printed and fairly edited, and makes interesting reading as a whole, even though half of it at least is a "back number."

A COMPEND OF HUMAN PHYSIOLOGY. (Quiz Compends, No. 4). By Albert P. Brubaker, A. M., M. D. Sixth edition. Revised and improved. P. Blakiston, Son & Co., Philadelphia, 1891; pp. 198.

This is a new edition of the admirable compend of physiology by Professor Brubaker. It forms one of the important series of manuals which the enterprise of the great publishing house of Blakiston has furnished to medicine and dentistry. All the essential principles are given in condensed form, and they thus afford the most convenient of text-books for ready reference. They should be at the elbow of every practitioner, and among them all, none is more valuable to either practitioner or student, than is this one on physiology.

TRANSACTIONS OF THE ILLINOIS STATE DENTAL SOCIETY FOR 1891. Published by the *Dental Review* Co.

The proceedings of this Society are always looked for with interest, and are usually issued with commendable promptness. The papers and discussions reported in the present volume are not quite equal to those of some years, although they are far from commonplace. There are too many earnest and able men in the Society to allow a meeting to be held which would be devoid of interest. The volume is neatly printed and bound.

VEST-POCKET ANATOMIST. By C. Henri Leonard, A.M., M.D. Fourteenth edition. Revised. Detroit: The Illustrated Medical Journal Co.; pp. 297.

For years this little work has been the constant companion of thousands of medical and dental students, and it will doubtless continue to be such for many years to come. It is founded upon Gray's Anatomy, and is, in the most convenient of forms, an epitome of that standard work.

THE PHYSICIAN'S VISITING LIST FOR 1892. Philadelphia: P. Blakiston, Son & Co.

This is the fifty-first annual issue of this indispensable to the physician. It contains all the usual tables, poisons and antidotes, posology, dosage—we cannot even enumerate the kinds of information tables that are found within its covers. It is the best of all the visiting lists.

THREE THOUSAND QUESTIONS ON MEDICAL SUBJECTS. Arranged for self-examination, with the proper references to standard works in which the correct replies will be found. Philadelphia: P. Blakiston, Son & Co., 1891; pp. 144.

This is a kind of compendium of the popular Quiz Compends. It contains questions in the several departments of medical science, with blank interleaves for writing the answers. With it the student can quiz himself, and thus assure his own proficiency.

PEARSON'S VEST-POCKET APPOINTMENT BOOK. R. I. Pearson & Co., Kansas City, Mo.

The most perfect thing of its kind that has ever been issued. We could not say more for it if we were to fill a volume. It has been improved from year to year, until the end seems reached. You can get it by subscribing for *The Western Dental Journal.*

CURRENT NEWS AND EXCERPTS.

THE RUSSIAN PLATINUM MINES.

All the platinum of Russia comes from one district, the government of Perm. In 1885, the output amounted to 110,635 ounces, and in 1886, to 184,336 ounces. Hitherto it has only been found in alluvial deposits, and is always associated with gold. The proportion of the two materials varies greatly, the platinum sometimes being in greater quantity than the gold, in other places not constituting above one per cent. The former deposits are the more profitable to work. The most important of these distinctly platiniferous deposits occur in the district of Nijni-Taguil, near the watershed of the Urals.

All the platinum-bearing streams of this locality descend from Mount Solovskaia, which is composed of a serpentine rock. The rivers have greatly exceeded their present size in former times, or else, which is more probable, have shifted their course; for the wide valleys in which they flow contain alluvial deposits of considerable extent, which are exploited for platinum, and to a less extent for gold. Between Mount Solovoskaia and the diorite mass of Mount Blanche the surface is covered with rounded boulders of serpentine and peridotite rock. As these boulders decompose under the action of the air, they form a sand or gravel from which the metal can be profitably extracted.

This is similar to what takes place in the weathering of the diamond-bearing peridotite rock of Kimberley, which is exposed to the disintegrating action of the atmosphere before being washed for diamonds. The platinum of the alluvial deposits occurs in grains. The gravel often contains one-half ounce per ton of platinum, but can be profitably worked for one-tenth ounce. The deposit near the banks of the River Martiane consists of a serpentine conglomerate, and is from four to five meters in thickness. Above is a thickness of twenty-three to twenty-four meters of barren ground, chiefly clay. Most of the alluvial auriferous deposits in which platinum is found are in the neighborhood of peridotite rock, or of serpentine rock formed by the partial alteration of the peridotite.

Thus the River Mioss takes its source from a mountainous district mainly composed of serpentine rock, and accordingly the auriferous deposits near the head of the river are rich in platinum; but further down stream, as the serpentine formation is left behind, the gold becomes less platiniferous. Small nuggets of platinum are sometimes found embedded in pieces of serpentine, of peridotite and of chrome iron ore, all constituent minerals of the peridotite rock, which there is good reason, therefore, to regard as the true mother rock of the platinum.

The richest deposit of the Nijni-Taguil district is that of Avrarinski. Here the platinum is found to the amount of four and one-half, five, and sometimes even nine ounces per ton. The metal contains a small proportion of gold, which is separated by amalgamation. The crude platinum left contains about ninety per cent. of pure platinum. From October, 1886, to August, 1887, the production at Avrarinski was 40,475 ounces.

The working of these deposits is, to a large extent, sublet by the proprietors to the peasants of the district, who are paid by the weight of metal obtained. They construct their own washing and other machinery, which is made of wood and is of a very crude description. The conditions with regard to cost of living, wages, and so forth, are, of course, very different from those obtaining in new countries, such as South Africa, where the precious metals are exploited.

ORAL PATHOLOGY.

At the Congress of Hygiene and Demography, held in London, during the past summer, the dental members made a very creditable showing. In our last number we published abstracts of papers by Professor Miller, Dr. Cunningham and Mr. Sewill. Concerning the first named of these, the two best medical authorities of the world express themselves as follows:

> "*The Mouth as a Source of Infection.*"—Professor Miller (Berlin) read a paper on this subject, an abstract of which will be found in another column. After the paper had been read a lantern demonstration was given, illustrating in splendid style the points referred to in the paper. Sir Joseph Lister, at the conclusion of the demonstration, remarked that we had good reason to be thankful that our bodies had the means of protecting themselves from those very numerous and very virulent organisms.—*The Lancet.*

> Professor Miller's paper, on the "*The Mouth as a Source of Infection,*" was followed with great interest, and was illustrated by a series of beautiful photographs projected on the screen.—*British Medical Journal.*

PLASTER OF PARIS FORMULAS.

1. *To Make Plaster Set Hard.*—Mix best plaster of Paris with about ten per cent.—more or less, according to effect ascertained by preliminary experiment—of very finely powdered marble (calcium carbonate). Or add to it about six per cent. of powdered alum, or about the same amount of ammonium chloride, before mixing it with water.

2. *To Make Plaster Set Slower.*—Mix it with two to four per cent. of powdered althæa root before adding the water. This not only retards the hardening of the plaster, but also enables it to be cut, filed, sawed, and turned.

An addition of eight per cent. of althæa powder retards the complete setting of the plaster for about one hour, so that the mass can be used for any purpose where it is to remain plastic during at least a portion of that time.—*Exchange.*

THE PATENT LAWS.

Our patent system puts a premium on rascality. I have taken out 700 patents for my inventions, but I never had one moment's protection. The people suppose that I have made money out of my inventions. The truth is, I have never made one cent. All I have made has been out of manufacturing. The companies with which I am connected have spent millions in trying to defend the patents. I have spent about $600,000 myself, and I believe that I would have been $600,000 better off if I had never taken out a patent. What I have made is because I have understood the inventions better, and have been enabled to manipulate the manufacturing better than those who pirate the patents. I could not have made anything had I not had a large capital back of me, and the ordinary inventor gets no benefit whatever. His certificate of patent is merely a certificate for the poor-house, and hundreds of inventors are ruined. They spend all they have in getting out their inventions, and then they die poor and disappointed. Our patent system is a system of villainy.—*Thomas A. Edison.*

TRIGEMINAL NEURALGIA AND IODIDE OF POTASSIUM.

In the last number of the *Neuroligisches Centralblatt*, reference is made to some singular facts related by Dr. Ehrmann as to the occurrence of severe facial neuralgia after the administration of even small doses of iodide of potassium. In the first case mentioned, a strong workingman of thirty-five suffered most intense pain in the forehead and teeth, with sensitiveness over the whole distribution of the fifth nerve, after taking fifteen grains of the drug. A second patient, after taking fifteen grains, had much pain in the region of the upper jaw, with pain and a tenderness in separate branches of the nerve, and also œdema of the eyelids on the left side. A third and a fourth patient also suffered similar symptoms after similar doses. They were associated in all cases with lachrymation and injection of the conjunctiva, but the symptoms rapidly vanished, and did not re-appear on a further administration of the drug. The cases are not only interesting, but important, for it is desirable to know as much as possible regarding any peculiar effects likely to be produced by a drug which is so frequently administered as an iodide of potassium.

THE PHYSIOLOGY OF DIGESTION IN INFANTS.

Dr. Booker found that milk remains in the stomach of infants for a much shorter time than in adults. The period depends upon the character of the milk and the age of the patient. In breast-fed children, during the first week, the stomach is sometimes found empty within an hour after nursing. The maximum period for breast-fed children during the first week is an hour and a half, and two hours for older children and those fed on cows' milk. It has not yet been determined whether the milk passes from the stomach continuously or periodically. During the few minutes after feeding, the reaction of the contents of the stomach is that of the food that was taken. After fifteen minutes, it is always acid. *Milk absorbs hydrochloric acid so rapidly that free acid does not appear until late.*

In disordered conditions of the digestion, milk remains much longer in the stomach than in health. Milk curds are sometimes washed out four or five hours after feeding. They sometimes become very hard and of bad odor. Excessive secretion of mucus usually accompanies disordered digestion.—*Johns Hopkins Bulletin, July, 1890.*

CHANGE OF NAME.

It will be noticed that in accordance with the announcements which have been made of this journal, its name and make-up have been modified, and it has been materially enlarged. Further improvements will be added as opportunity offers.

THE ELEVENTH INTERNATIONAL MEDICAL CONGRESS.

The *Dental Review* throws up its hat in glee because in the first official proclamation of the congress that is to meet in Rome, Italy, in 1893, no section of dentistry is mentioned.

It should not be forgotten that the notice which has been issued is only preliminary, and includes but those sections that have been already organized. Only twelve are named, while the Congress of 1890 had eighteen sections. The others will be arranged in due season.

It should also be understood that each section must organize itself. Dentistry in Italy is weak. In view of these facts, the officers of the Dental Section of the Berlin Congress had a meeting, and agreed to assist, so far as is within their power, in the establishing and sustentation of a dental section in the next congress. Magitot, of Paris, is at the head of the movement, and will let slip no opportunity to further its ends. A section will certainly be formed.

It would seem, then, that the *Dental Review* is a little "previous" in its rejoicing. Even if there were ground for its hilarity, it should be a matter of regret to dentists generally, for while it might tend to promote private or local interests, it would be a great blow to dentistry as a whole.

AS OTHERS SEE IT.

As must be well known to our readers, each of the States of North America, both in Canada and the Union, have been passing dental laws which appoint State examiners, before whom men who wish to practice in that particular State must go, whether they possess a diploma or not. This tacit ignoring of the dental colleges has given rise to a good deal of friction. It was felt on all hands that there were some colleges whose curriculum and test examinations were quite inadequate, but on the other hand there are many colleges against which no such charge can be brought.* This grouping of good and bad together has not been productive of harmony. Another objection to the present system is, that if a man who has been practicing in one State wishes to change his abode and move to another, he must again be examined before the Board of his new State before he will be allowed to practice. We can scarcely see any injustice in this, supposing he moved to an absolutely new country, but as it is only going from one to another of the United States, it does seem irksome. It is now proposed that a committee of the State Boards shall attend the college examinations, and that if they hold them to be satisfactory, the diplomas of these colleges shall be recognized as titles to practice.—*British Journal of Dental Science for December.*

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* This is also emphatically true of Examining Boards.—EDITOR.

THE BEST METHOD OF ADMINISTERING ETHER.

Dr. John A. Wyeth, of New York, said that the first article of his surgical faith is safe anæsthesia. He referred to his having formerly said that he had never learned to give ether properly. He uses chloroform in about fifty per cent. of his cases, but believes ether to be the safer agent in general surgery. The quantity of ether employed has been used as an objection, on account of the resulting renal or respiratory disease. He now gives ether with the Ormsby inhaler. It is the best he has seen, and requires a minimum of ether. Prolonged anæsthesia was recently sustained in a young man, with one ounce. With this inhaler, the patient partly breathes the same air over and again, as the ether vapor is confined in a rubber bag, so that the anæsthesia is, to a certain extent, safe carbonic acid gas asphyxia. The ordinary inhalers require the constant admixture of free air and ether. This chills the respiratory tract, resulting probably in kidney or other disease, etc.

DEATH FROM TOOTH SEPSIS.—Dr. Miller informs us of a recent case of death succeeding a dental operation in Berlin, which illustrates the importance of the antiseptic precautions that he recommends in his writings. The Baroness Martha Von ——, engaged to be married to an officer of high rank in the German service, had a tooth filled. (Report does not say which tooth it was, but probably it was a lower molar). Soon after the operation peticementitis supervened, followed by great swelling of the lower part of the face and the neck. Laryngotomy was performed by Professor Schrötter, and every means employed to prevent the spread of the infection, but in vain. The young lady succumbed to the progress of the septicæmic condition, and died in fearful agony.

WHEW!!—Dr. H. M. Whelpley sends the following for publication. He will evidently soon outgrow St. Louis, and be forced to move to Cairo for elbow room.—EDITOR.

Dr. H. M. Whelpley, Ph.D., F.R.M.S., now has the chair of Physiology and Histology at the Histological Laboratory, and is Secretary of the Faculty of the Missouri Medical College. The doctor is also Professor of Microscopy in the St. Louis College of Pharmacy, and edits the *Meyer Brothers' Druggist.*

CLEANSING OF THE HANDS.—Carbolic acid is removed from the hands by bathing them for a sufficient time in alcohol and then anointing them with lanolin or vaseline. After the use of corrosive sublimate solution the hands should be bathed in a solution of common salt, 1 to 50, then washed with soap and water, and finally rubbed with lanolin. —*Pharmac. Central.*

PROFUSE HEMORRHAGE.—Never give stimulants in a case of profuse hemorrhage. The faint feeling, or irresistible inclination to lie down, is Nature's own method of circumventing the danger, by quieting the circulation and lessening the expulsive force of the heart, thus favoring the formation of clot at the site of injury.—*Clinique.*

HOW MEN LIVE.—Of the entire human race, 500,000,000 are well clothed; that is, they wear garments of some kind; 250,000,000 habitually go naked, and 700,000,000 only cover parts of the body; 500,000,000 live in houses, 700,000,000 in huts and caves, while 250,000,000 virtually have no shelter.—*Science News.*

GELSEMIUM IN NEURALGIA.—Neuralgia of the fifth nerve, not dependent upon decayed teeth or disordered stomach, may be relieved by five-drop doses of fluid extract gelsemium, administered three times a day.—*Medical Bulletin.*

THE

DENTAL PRACTITIONER

AND ADVERTISER.

VOL. XXIII.—BUFFALO, N. Y., APRIL, 1892.—No. 2.

RUBBER AND THE PROCESS OF VULCANIZING.

BY DR. W. C. BARRETT.

Read before the Stomatological Club of Buffalo, March 8, 1892.

India-rubber, or caoutchouc (koo′-chook), consists of the coagulated milky juice of some trees and shrubs, belonging to certain natural orders of the vegetable kingdom. The vegetable exudates best known may be divided into four classes.

First. Those soluble in water. These are the true gums, like gum-arabic, gum-tragacanth, etc.

Second. The resins, which contain ingredients insoluble in water but soluble in alcohol; such as mastic, sandarac, copal, shellac, etc.

Third. Balsams, which are a natural mixture of resins with volatile oils; such as Venice turpentine, Canada balsam, copaiba, tolu and benzoin.

Fourth. The hydro-carbons, which includes the turpentines, gutta-percha and caoutchouc.

The latter is obtained from the juice of the India-rubber tree, and an analysis of the freshly obtained product gives in 100 parts:

Water, with a little free acid,	56.37
Caoutchouc,	31.70
Albumen,	1.90
Nitrogenous Matter,	7.13
Matter insoluble in water,	2.90
	100.00

It will thus be seen that the dried product of the rubber tree consists of caoutchouc, with a little albumen and nitrogenous matter. Further along it will be discovered that these two last ingredients, unless the caoutchouc be freed from them, may by their decomposition injure the quality of rubber gum.

The caoutchouc is held in suspension in the watery fluid that exudes from the tree by ammonia, and so forms a vegetable emulsion. Upon exposure to the air the ammonia is given off, the caoutchouc coagulates and the water evaporates, while the other ingredients are held within the inspissated mass. Coagulation may also be induced by the addition of an acid, or a saline fluid, alum or salt water being commonly employed. If ammonia be added to it coagulation is prevented. If salt water be added the gum is injured by being made very hygroscopic, or capable of absorbing a considerable quantity of water.

Pure caoutchouc is then a hydro-carbon, it being composed of carbon and hydrogen exclusively, in about the proportions of 87.5 per cent. of the former to 12.5 per cent. of the latter. It possesses peculiar properties, among these being extreme elasticity and great tenacity. It is insoluble in water, alcohol, alkalies and acids, with the exception of concentrated nitric and sulphuric acids, but is soluble in the ethers, chloroform, and best of all in bi-sulphide of carbon. When pure, it is colorless, with a semi-transparent appearance. The gum was known to commerce long before the process of hardening it was discovered, and was employed for various purposes. As far back as 1797, a patent was obtained in England, by a Mr. Johnson, for rendering clothing water-proof by means of a thin coating of the gum. He dissolved it in equal parts of oil of turpentine and spirits of wine, varnished the cloth with this, and then sifted over the surface silk, wool and other substances. In 1813, a patent was issued in the United States to Jacob F. Hummel, of Philadelphia, for a varnish of gum-elastic. In 1819, Mackintosh, a Glasgow manufacturer, dissolved the gum in oil of naphtha and entered upon an extensive manufacture of water-proof garments. To this day they are called Mackintoshes in England.

The tree that produces the gum grows in nearly all tropical countries, and is found as much as 500 miles from the equator. But the quality varies materially with the locality, not only in the amount of foreign material which it contains, but in the nature of the caoutchouc itself. African rubber, and that of Guatemala, contain a comparatively large amount of the resinous and nitrogneous matter, and are therefore inferior. The best quality is the product of trees which grow in the provinces of Para (Pa-rah′) and Ceara (Sa-ah-rah′), in the northern portions of Brazil. Not only is this gum purer and stronger, but it is usually better cured than that produced in many localites.

The demand for the higher grades of rubber has long been in excess of the supply, and this has induced the mixing of inferior qualities with the Brazilian gum, whenever the price ran too high. In 1879, there was imported into England alone about seventeen millions of pounds of the gum. In 1872, America imported about twelve millions of pounds, about five millions being from Brazil, six millions from Central America, the rest coming from Mexico, India, Africa, etc. Since that time the amount used has, of course, increased enormously.

The rubber-tree grows, in Brazil, to the height of about sixty feet. The juice is obtained during the dry season, between August and February. The flow is most abundant at night, the trees being tapped at evening and the gum collected the next morning. A deep, horizontal incision is made near the base of the tree, and leading into that a perpendicular one, with oblique incisions radiating from that. Cups of clay, that have been previously prepared by drying in the sun, are stuck just under the lower incision by means of fresh clay. Into these the juice runs. A tree yields only about two ounces per day for three days, and as the ammonia soon evaporates and the gum coagulates, it must be gathered each day. If it is necessary to carry it any considerable distance, liquid ammonia is added to the juice to prevent coagulation.

When the juice is collected, it is put in a vessel before coagulation shall have taken place, a flattened clay mould is fastened to a handle about three feet long, and over this mould the juice is poured, or it is dipped in the vessel containing the liquid. This layer, which is distributed as evenly as possible, is then warmed and dried very carefully, by turning the mould round and round in the vapor obtained by heating certain oily palm-nuts. Each layer of rubber is allowed to become thoroughly coagulated and dried before adding another. A good hand can thus cure five or six pounds an hour. When the rubber has attained a sufficient thickness, it is split with a knife and removed from the mould. This forms the very best article of commerce, and is the finest that can be obtained.

The last scrapings of the tree, with the residues of the cups in which it is collected and the refuse of the vessels employed, are made into balls called negro-head. This is, of course, inferior, as it contains woody fibre and much foreign material, besides being improperly cured, through spontaneous coagulation. Thus it may be seen that there are at least three grades of pure Para rubber: The first, that which has been cured according to the above method; second, that to which it has been necessary to add liquid ammonia to prevent coagulation until it can be carried to the place of curing; third, that which has coagulated spontaneously, and which is mixed with foreign material—the so-called negro-head. The foreign substances, woody fibre, etc., may be removed by subsequent purification, but the bad curing permanently injures the quality of the gum.

These differences exist in the quality of Para rubber. When we take into account the fact that the rubber of other countries also presents distinct grades, besides being inherently inferior, and that there are different transparent gummy materials, manufactured at a cheap rate for the purpose of adulterating the various kinds of rubber, it may readily be seen that it requires an expert to determine what is the grade of any particular rubber, and that the consumer has little save the reputation of the manufacturer to guarantee the quality of his purchase. He may be getting second or third quality, even though he is guaranteed pure Para rubber by a responsible manufacturer, while it may be mixed with Guatemalian, or Mexican, or Cartagenian, or Cuban, or African gum to a greater or less extent. In this country, the attempt has been made to substitute for it certain hydro-carbon gums, as the juice of the Asclepias or milkweed, but as they do not contain the peculiar principle, caoutchouc, of course the efforts have failed.

In the preparation of rubber for manufacture, the first thing is to rid it of all impurities. These may be merely accidental, as the woody fiber of the trees, the fragments of the clay vessels, etc., or they may be incorporated in the rubber, such as acid products of the fermentation of the albuminous and nitrogenous ingredients of the gum-like matters, fatty substances, etc., with alum and sulphuric acid used in coagulating it. The balls of negro-head rubber frequently contain stones, sticks, dried grass, and many other substances. The rubber is softened by hot water, and then sliced up with sharp knives, the coarse foreign matters being removed. The slices are passed between grooved rollers, a stream of hot water passing over them, and thus impurities are washed away. Further kneading, with diamond-grooved rollers, fits it for the next step.

Up to the time of the discovery of the process of vulcanizing rubber, the uses for it were comparatively limited. Garments were made waterproof by it, but the gum coating must either be covered with lint or very slowly dried. Nitric acid was employed to erode the surface and deprive it of some of its stickiness, but it only partially accomplished the purpose. Previous to 1838, Nathaniel Hayward had mixed sulphur with rubber by impregnating the solvent with it, but he had not completely solved the problem of hardening it. In 1838, Mr. Charles Goodyear was manufacturing rubber life-preservers and other articles, drying the rubber by means of sulphurous acid gas and the sun's rays. He employed Hayward, and purchased from him the sulphur process, taking out a patent as the assignee of Hayward, February 24, 1839. But the incorporation of sulphur imparted to the rubber an offensive odor, and did not keep it pliable in cold weather. Charles Goodyear, however, continued his experiments, and at last discovered the fact that the application of sufficient heat caused the sulphured rubber to become pliant in cold weather, increased its elasticity at all temperatures, and destroyed much of the offensive odor. Thus, vulcanized rubber became an established fact, and a patent was first obtained for it June 15, 1844.

Nelson Goodyear subsequently further improved the process, and first produced ebonized or hard rubber, thus extending the usefulness of the material into a thousand new fields, for Charles Goodyear never contemplated a rubber product that was not elastic. Many of Nelson Goodyear's patents, however, were for the incorporation of white lead and many other mineral or earthy ingredients, to change its characteristics and allow its more ready working.

There are various methods of mixing the sulphur with the rubber. It is not sufficient that the two be merely brought together. The sulphur must be in actual combination with the rubber. If a sheet of pure rubber be immersed for a few moments in a bath of melted sulphur it absorbs about one-third its weight, but although its color is changed somewhat it is yet unaltered in its characteristics, because the two are not yet chemically united. But, if it be now subjected to a sufficiently high temperature, combination sets in and the result is what is known as vulcanized rubber. If the melted sulphur bath be at a temperature of 320° F., the absorption and incorporation occur simultaneously. Vulcanization of rubber, therefore, is not the application of heat, but the combining with sulphur, which does not take place at ordinary temperatures.

There are other methods of hardening rubber. If cut sheets of the gum are placed in a leaden cupboard into which the vapor of chloride of sulphur is introduced, or if they are dipped for a few seconds into a mixture of one part of chloride of sulphur and forty parts of carbon bi-sulphide, or purified light petroleum, the process takes place without the action of heat. Cut sheets may also be vulcanized by placing them in a solution of the poly-sulphides of calcium, at a temperature of 320° Fahr. There are also other processes for hardening rubber, as by the use of iodine and other substances.

A temperature of 320° is not necessary for the vulcanization of rubber. In fact, if it be raised to this point the character of the product is materially injured. If the sulphur be thoroughly mixed with the gum and the whole be subjected to a temperature as low as 240° Fahr. for a sufficient time, it becomes vulcanized and will be more elastic than if vulcanized for a shorter period at a higher temperature. Any point above the melting point of the pure gum is sufficient, if enough time be allowed for the combination to be perfected.

If a larger proportion of sulphur be mixed with the rubber, and the vulcanizing process be done at a high temperature, or be long continued, the character of the product is materially changed, and hard rubber or ebonite is the result. About 40 per cent. of sulphur is ordinarily used for this purpose. A cheaper kind of rubber is commonly employed, or it is "loaded" by mixing with it a considerable quantity of some earthy material. The prepared gum is colored by incorporating sufficient of whiting or lampblack. Dental rubbers are colored by vermilion.

Rubber may be made porous when vulcanized, if there be incorporated in the gum any substance that gives off a gas at the vulcanizing temperature. Porosity is always the effect of some decomposition within the substance of the mass when vulcanizing. Thus, if alum shall have been used in coagulating the juice of the tree, and it shall not have been entirely removed, the result will be a porous rubber when vulcanized. Carbonate of ammonia will produce the same effect, as will small particles of wood, or other decomposable material. It is possible, too, that rubber which is hygroscopic through having been precipitated by salt, may contain sufficient moisture to make it porous when the mass is raised above the boiling point of water. If the temperature be suddenly raised to a high point, the rubber may become fixed and vulcanized in a porous condition, when if more time were allowed the vapors might escape, and if the prepared gum were under pressure it might become solid. The sponginess is not due to any changed condition of the rubber itself, but to the presence of a distending gas. Any uncombined sulphur is injurious, but an excess of sulphur is desirable to insure perfect vulcanization. It should be removed from the finished product by a solution of caustic soda, or some other solvent.

Water-proof clothing and articles of that kind are made by spreading over the properly prepared cloth repeated thin coatings of a rubber varnish. This may have the sulphur incorporated with it previous to its application to the cloth, in which case it is afterwards vulcanized by steam heat, or if silk or wool is employed no sulphur is used, the dried coating being simply brought for a moment into contact with a mixture of chloride of sulphur and carbon dioxide.

Cushions, beds, gas-bags, and other articles made to contain air, are formed of textile fabrics covered with rubber, the different parts being cut to a pattern and then joined while they are soft.

Rubber boots and shoes are made in the same manner, of a low quality of rubber—African or Indian—the cloth being covered more thickly than for ordinary articles. The rubber is colored very black, highly varnished, and vulcanized in ovens heated to about 275° Fahr.

Elastic ribbons and cloths are made by incorporating in the crimped material threads of rubber cut very small. For the vulcanization of the various articles of manufacture, ovens or cylinders, sometimes of large size, are specially constructed, and these are usually heated by steam.

For the rubber dam of the dentist, only the first grade of Para rubber should be used. But this is at times hard to obtain, while the price is always high. Hence the temptation to use a cheaper rubber, or at least to mix with the first grade some of a poorer quality, is very great, and only houses of established reputation and of unswerving probity can be depended upon to furnish in every case what is wanted. Dental supply houses are no more able to determine the quality of the gum used in a sheet by its appearance, than are dentists. It is only the crucial trial of every-day use that will reveal the truth, and even this test is sometimes uncertain. Rubber deteriorates with exposure to the light and air. It oxidizes, the same as do many other things. In the presence of ozone it very rapidly deteriorates, and of course oxygen gas would soon spoil it. The presence of ammonia also injures it, as was explained in speaking of the methods of gathering the juice.

The gum may not only be mixed with cheaper grades of rubbers, but there are so called " rubber substitutes," gummy materials used in adulterating it. Even though the gum used be pure Para, it may have been badly cured, and this will have affected the quality of the product. And if perfectly pure Para gum be obtained, that was properly coagulated and cured in its gathering, that is not the last factor in the preparation of rubber for manufacture. It should be cut, and then kept for at least a year, that the process of drying may be complete. If this be not done there will be a greater or less degree of porosity, through the formation of gases during vulcanization, and the sheet will be less tough and durable. But the carrying of a large stock of costly grades of rubber, with the attendant losses and interest upon the money invested, is an expensive affair, and the temptation to cut the time short is irresistible to all but the wealthiest and most conscientious manufacturers.

Then again, the utmost care is needed in the process of manufacture, or the product will be injured. If the rollers used in mixing, kneading and spreading the rubber, be too hot or not hot enough, the result will be unsatisfactory. If a little too much sulphur be incorporated, or if it be vulcanized at too high a temperature, the sheet will be injured, If it be not evenly rolled out into the sheets, it will draw unevenly and prove unsatisfactory. If deleterious gases come in contact with it, or if it be allowed to oxidize after vulcanization, it is damaged. The dentist himself may allow it to be impaired, and then throw the blame upon the manufacturer. Hence, it may readily be seen that the dental rubber dam is subjected to very many chances for injury, even though the quality was of the best at the outset.

The thickness of the sheet has considerable to do with its usefulness. If too heavy, it is stiff and unyielding, while if too thin, there is not enough of substance. Some of the very thin sheets, too, are prepared by another process than that of vulcanization. It may be cured by what I have described here as the "acid process," or by some of the other cheaper methods. In speaking of them in an earlier part of this article, it will be remembered that I said that the rubber was exposed for but a very short time to the fumes of chloride of sulphur. This is very injurious to the workmen, and the rubber prepared by any of these acid processes is likely soon to deteriorate. Besides, as it can be exposed to the acid for only a short time, the surface only is acted upon, and if the sheet is thick, it is not homogeneous; hence, these kinds of rubber dam are usually made very thin.

I show you such a piece. It is of German make, and is quite largely sold in Canada, though comparatively little is brought into this country, because of the high tariff upon it; so, in this case, at least, the high duty not only protects home manufacture, but it secures the consumers against fraud. You will see that the rubber is of a better color than American rubbers, it being a light orange; but it will soon deteriorate, and is unreliable.

Perhaps the best known of the manufacturers of rubber dam in this country is The Davidson Rubber Company, of Boston, to whom I am under obligations for information in the preparation of this article. Their dam is usually put up in tin boxes, containing a roll six inches wide. This preserves it from oxidation, while it is in convenient form for use. There are a number of grades in thickness, that which is most widely used and which gives the best results being the one-hundred-and-sixtieth part of an inch in thickness, and numbered on the boxes No. 141. If there is any better dam manufactured, I have not yet had any experience with it.

There is much in the methods of using the dam. The manner of cutting the holes even is of great importance. One of the most satisfactory clinics that I ever witnessed was once given by Dr. L. D. Shepard, of Boston, and he illustrated nothing more than the proper application of the dam. I am inclined to believe that clinical operators often attempt to demonstrate too much at one time, and so mass together processes that should be illustrated in detail.

As this Society, by its By-Laws, is prohibited from giving clinics, or discussing subjects from a merely professional point of view, its objects being the examination and discussion of strictly scientific matters, it is not within the scope of this paper to take up the subject of the proper use in practice of the rubber dam, and I shall stop here, promising that in another Buffalo Society, of which the most of us are members, I will consider the best methods of the application of the dam, the proper way to cut the holes for the teeth, and perhaps illustrate the whole by a clinic, either in person or by proxy.

IMMEDIATE ROOT FILLING.

BY R. H. HOFHEINZ, D. D. S., ROCHESTER.

Read at the Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York, held in Buffalo, October, 1891.

During my attendance on the Ninth International Medical Congress at Washington, in August, 1887, I listened to a paper which, at the time of its reading, caused a storm of indignation among some of the best known members of our profession. The paper was headed "Management of Pulpless Teeth." The gentleman, Dr. Junius E. Cravens, advanced two distinct factors in the treatment of pulpless roots. First, the filling of all pulpless roots without any previous use of medicinal agents. Second, the immediate filling of all pulpless roots.

He claimed to have advocated a system of treatment by which the structure of dentine is not impaired by saturation with foreign substances, a system that recognizes the necessity of a normal pericementum, that seeks to protect that membrane from contact with all foreign agents, to the end that a longer tenure of usefulness for pulpless teeth may be assured. He treats the entire matter mechanically. He said:

> "A pulp canal is merely an axial opening through a root, and the countless tubules that open into it only serve to render canal medication the more objectionable, and with a large number of dental practitioners the idea prevails that pulp canals must always be treated for some imaginary condition before filling."

It seems strange to listen to such words at the present age of Bacteriology and Antiseptic surgery. What would become of the labors and achievements in this field accomplished by Prof. Miller of Berlin, this Lister of Dentistry, and his able lieutenants, men like Drs. Black, Barrett and others in this country, if one man can banish mephitic odors by simply cleaning the canals with a slightly "barbed broach, about which a few fibres of absorbent cotton have been loosely wound so as to form a swab?" And yet the doctor claims success by this mode of treatment.

Whatever may be the opinions of others regarding the value of this paper read four years ago, it can not be denied that it was one of the first advocates of a mode of filling roots by the immediate filling system, a method which, though much contested by some of our most able men, gains more ground daily. The filling of root canals has been spoken of in every dental society. The literature on the subject abounds in contributions of all kinds, and yet a uniform method has not been established. We find that one will put his pellet of cotton saturated with some antiseptic in the root canal again and again, and when the patient, tired of the numberless calls, timidly asks the doctor, "How often must I come yet?" the answer is finally given, "Just once more."

We find the one who fills each root with cotton claims success. I have even heard men who in local societies stand well, claim that their best success is in cases in which they did not fill roots at all. We have within the last few years met men who filled roots by the immediate filling system, and who also claim success. It seems a little strange to find so many ways leading to a prosperous issue. Even if it be but relative, it must be admitted that there is more than one method to insure success in root filling. The only way to prove the relative value of any new mode of treatment is by comparing it with other methods. The only complete comparative statistics that I have been able to obtain in the literature accessible to me, is that of Dr. George Cunningham, of Cambridge, England. He gives an account of all roots filled, both by the dressing and the immediate methods, from 1882 to 1887. All roots were cleansed, treated antiseptically and filled with oxychloride of zinc (in most cases).

	Total No.	Percentage.
Dressing	122.	100
Immediate	512.	100

Cases requiring subsequent treatment:

		Total No.	Percentage.
1st. For slight periostitis	Dressing,	36.	29.5
	Immediate,	5.	1.15
2d. For swelling or abscess	Dressing,	32.	26.2
	Immediate,	5.	0.97
3d. By extraction	Dressing,	6.	4.91
	Immediate,	3.	0.58
Cases compared in equal periods, 1883-4; 1886-7	Dressing,	38.	100.
	Immediate,	150.	100.
Number of these cases in which permanent fillings immediately followed	Dressing,	2.	5.26
	Immediate,	61.	40.66

These statistics speak very powerfully, and I regret that I cannot give you any additional ones with such precision.

In filling root canals I look upon three factors as the most essential necessities for success:

1st. A healthy diathesis of the patient, and good active vitality.

2d. A skillful manipulation.

3d. Antiseptic remedies.

I believe with Dr. Fillebrown and the many authorities he quoted, that vitality is one of the most powerful germicides. In a quotation of Dr. Lawson Tait, he says:

“The uniform experience of operating surgeons has taught them that the success of their work depends upon three factors:

1st. The condition of the patient.
2d. The condition of his surroundings.
3d. The nature and extent of the operation performed.

Of these three, undoubtedly the most uncertain factor is the first. What condition of the system it is which is most favorable to operations is almost unknown. I am perfectly certain that apparent perfect health is by no means a certain indication of a power of resistance to those conditions which result in septic poisoning."

This sentence holds equally good regarding root filling. It is well known that the most carefully treated teeth, with patients in an apparently healthy condition, have given subsequent trouble.

Before entering on the subject of the treatment proper of pulpless teeth, I wish to state that I am one of the few unfortunates to whom the Latin adage applies: "*Nemo artifex nascitur;*" one of the few who meets with failures in all branches of his profession. Absolute success in filling all pulp canals to the very apex (and sometimes a little beyond it) are achievements which are foreign to me. I try to get to the apex as nearly as I can, and then stop.

Pyæmia, septicæmia and pus formation, are due to the existence of micro-organisms, or the alkaloids of their waste products, and it is pretty generally conceded that nearly all of the diseases the dentist is called upon to treat are due to the presence of bacteria. There are four different conditions in which a pulpless root may present itself for filling:

a. Where the pulp was removed in a comparatively healthy or non-putrescent condition, being recently destroyed.

b. Where the pulp canal is found in an empty and dry condition.

c. Where the pulp was in putrid state, with accompanying blind abscess.

d. Where a fistulous opening exists.

There is, I believe, no discrepancy regarding the filling of the root canals if presented in the first condition of newly destroyed pulps. This, together with the second and fourth conditions, are the most favorable for immediate root filling. The first essential necessity to get at any root canal is to gain direct access, and not try to work around corners, whatever tooth structure may have to be sacrificed. The second essential necessity I consider the enlargement of every root canal to its utmost possibility, and I believe that to that fact belongs the merit of many successful operations, above anything else. Where the pulp has been destroyed, the tubuli remain filled with organic matter, to decompose in time and generate gas. However a pulp canal may be treated to get it into an antiseptic or aseptic state, the question whether the tubuli have been thoroughly reached by the germicides remains in doubt, and the gases may permeate the cementum and cause irritation of the pericementum. I therefore strongly urge the enlargement of every pulp canal, if possible. Every successful cut disposes of some material that may give trouble in the future.

The next step after as thorough a mechanical cleansing as the individual case may permit, will be the choice of the best remedy to place the pulp canal in an aseptic condition. Dr. G. V. Black, on the value of antiseptics, says:

> "The antiseptic value of a drug is best expressed by its range of effective work. This range of value is found in the difference between the saturated solution, or that concentration that may be found injurious to the tissues, and the greatest dilution that inhibits the development of micro-organisms. Those essential oils that are not too irritating have an extension of range in their use in emulsion, or in substance. Also many drugs have, in greater dilution than that which actually inhibits, a range of restraint that is useful."

In one of the many scientific papers that Prof. Miller presented to the dental profession, there is one on "Experiments on the Comparative Value of Various Antiseptics in the Treatment of Diseased Teeth." In it he says:

> "If we ask the question, which of the many antiseptics found in the dental *materia medica* is best adapted to prevent decomposition, either of inextricable pulp remains or of whole pulps, we will obtain answers which will convince us that the greatest diversity of opinion exists in regard to this question."

The article is followed by a description of different experimentations to determine what antiseptic penetrates pulp tissue most readily and deepest, and most effectually preserves it from decomposition.

He arranges them in the following classes:

1st. Those pre-eminently active in preventing decomposition of pulp tissue:

Bichloride of mercury, cyanide of mercury, trichlorphenol, sulphate of copper, carbolic acid, oil of cloves, chloride of zinc, camphor-phenic and hydronaphthol.

2d. Those of doubtful value:

Thymol, salicylic acid, eugenol, naphthol, tartrate of aluminium, five per cent. solution of bichloride of mercury, and some essential oils.

3d. Those nearly or quite worthless:

Iodoform, basic aniline coloring matters, borax, boracic acid, chloride of lime, peroxide of hydrogen, iodol, tincture of iodine, spirits of camphor, naphthaline, the double cyanide of mercury and zinc, and many essential oils.

Like all experiments of Prof. Miller, these are also based upon profound and careful researches, and we can undoubtedly safely accept the results, which limit our choice for antiseptics very materially.

The last step in filling pulpless canals of teeth is the filling proper. You all know how many different materials are used and recommended, the principal ones being gutta-percha, chloro-percha, oxy-chloride of zinc, oxy-phosphate of zinc, gold, tin, lead, wood, cotton and no doubt a number of others.

Oxy-chloride of zinc, owing to its antiseptic property and the assumption that it penetrates the tubuli, is preferred by many. Gutta-percha introduced in various ways is preferred, owing to its easy manipulation, non-destructibility, and, as Dr. Barrett says, "its being a neutral material." I confine myself to gutta-percha, chloro-percha and oxy-chloride of zinc. As previously mentioned, there is little or no discrepancy about the filling of condition *a*, where pulps are freshly destroyed and extirpated. Condition *b*, where the pulp canal is empty and relatively dry, is very favorable for immediate filling, provided no blind abscess can be diagnosed. My mode of treatment after a thorough mechanical cleansing, is disinfection by a ten per cent. solution of bichloride of mercury, and in back teeth I use as strong as a twenty per cent. solution. I have acidulated my bichloride of mercury since the controversy of coagulants and non-coagulants has existed, but I am unable to see any difference in the results as yet. After the use of the bichloride of mercury, of which I am cautious not to pass any through the apical foramen, I follow with full strength of carbolic acid, of which I do not hesitate to let the apical foramen be minutely penetrated.

Dr. French, in his able paper on carbolic acid, says:

> "It seems to have the effect of promoting growth of healthy granulations, and hastening the healing process of wounds. It relieves pain without causing inflammation, and arrests suppuration."

After drying the canal both by absorption and heat, I fill it permanently.

Condition *c*, where the pulp canal is in a putrid state and a blind abscess can be diagnosed, is the least favorable for any filling, be it by immediate or the dressing system. The blind abscess is the source wherefrom future trouble may arise.

After the mechanical cleansing, I inject peroxide of hydrogen into the abscessed tissues. Dr. Richardson, of London, found that peroxide of hydrogen imparts its oxygen to the diseased tissues, thus destroying them. The great affinity for pus makes this drug valuable as a diagnostic remedy, aside from the use of the microscope to determine the presence of pus corpuscles. After the frothing process has ceased, I follow with a ten per cent. solution of bichloride of mercury, follow this with carbolic acid, and finish with crowding iodoform into the root previous to filling. Although the recent experimentations of Miller and others have proven the valuelessness of iodoform as a germicide, its use has not been abandoned. Such eminent men as Billroth, of Vienna, have used it quite recently in antiseptic dressings.

I have found that in all cases of immediate root fillings of condition *c*, where I used iodoform, the pain was less apt to become intense and the chances for a favorable result better. It may be owing to the antiphlogistic and anæsthetic properties that are attributed to the drug. After removing the rubber dam, I apply a twenty per cent. solution of muriate of cocaine to the gum tissues opposite the apical foramen of the root, and make an incision through the soft parts and the alveolar process, thus making an opening for any possible after formation of pus. I paint freely with aconite and iodine to stimulate the lymphatics.

Condition *d*, where a fistulous opening exists, if there be no obstruction to the passing through of medicinal agents, is a very favorable condition for immediate root filling. After mechanical cleansing I use peroxide of hydrogen, passing it freely through the foramen with the Lewis abscess syringe. After this I dry the root canal, fill it with cotton saturated with a ten per cent. solution of bichloride of mecury, to get the effect of the strong germicide in the tubuli. I dry it again, and follow with full strength carbolic acid through the root and fistulous opening. I again dry the canal, fill it, and look for no following trouble.

Previous to filling roots by the immediate system, I had reserved from one-half to one hour daily for their treatment, and I was less successful in my results. I fill, since the introduction of bridge work, more than double the number of roots, and meet with less fatal consequences. How much the suggestions of the pathological conditions of pulpless teeth and the changes produced by treatment may be a source for debate, there is no question as to the silent eloquence of facts, such as Dr. Cunningham has presented in his statistics.

I fully agree with Dr. Miller when he says:

> "In attempting to assign the success or failure of operations upon diseased teeth to their proper causes, factors of the greatest importance are frequently left out of account, and the results ascribed to some agent may have been entirely indifferent. One of these factors, which forms the very foundation of successful root treatment, is the *manner* in which the mechanical cleansing of the canal is carried out."

The fundamental principle in treating diseases is to remove the cause. The primary cause of any pathological condition of a pulpless tooth is the root canal, with its infected tissues. After a skillful manipulation of the root, and proper medicinal treatment and thorough closure, I think we can safely trust our new friend Metchnikoff and the phagocytes to assist us in the parts that we may not reach.

Dr. Frank W. Low, in his paper on Phagocytosis, says:

> "In the existence of the phagocytes we have an intelligent explanation of the successful outcome of much of the *careless* immediate root filling which is undoubtedly being done the whole country over."

If this theory is applicable to careless filling, how much more assistance must the phagocytes render in *careful* immediate root filling.

TREATMENT AND DESTRUCTION OF THE PULP.

BY DR. FRANK FRENCH, ROCHESTER.

Read at the Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York, held in Buffalo, October, 1891.

Some years ago, at a meeting of the Dental Society of the State of New York, there was present one of those meteoric interrogation points who have been heard from in all ages, for we even find them mentioned in Holy Writ, as follows: "Verily, knowledge shall perish with them," Tim. 10 : 16. Accosting one of the older practitioners, he said: "Well, Dr. Blank, I suppose you save all nerves?" The reply was, "Yes, certainly." "Will you tell me how you save them?" "Yes, some of them I dry, and some I preserve in alcohol." While I do not by any means advocate the wholesale destruction of the pulp of the tooth, for I believe in saving it alive if possible, I think most practitioners of fifteen years' standing will agree that those which have been dried and saved in alcohol are far more satisfactory, both to patient and dentist, as a rule, than those which have been capped, excepting, of course, those where the conditions were entirely favorable. Various methods have been used to destroy the pulp, the most primitive being to heat a fine instrument or wire red hot and thrust it as far into the pulp canal as possible. A modification of this treatment has for several years been practiced by the lightning bridge and crown workers, who taper a piece of hickory or orange wood to a very fine point, and, with a mallet, drive it into the pulp canal. Both these treatments are very efficacious, and absolutely without pain —— to the dentist. A very interesting article might be written, giving a history of the different means employed to destroy the pulp, but it is not within the scope of this paper.

We all of us have cases where for a variety of reasons it is advisable to destroy the pulp. How can this be done with almost absolute certainty, and with very little, if any, discomfort to the patient? Under the head of "Incidents of Office Practice," in our District, as well as in our City Society, it has been mentioned several times that difficulty had been experienced in destroying the pulp, even with several applications of arsenical paste, and that much discomfort and pain to the patient had followed. During a practice extending over many years, it very rarely happens—not more than once or twice a year—that I have to make a second application to destroy a pulp, and almost as rarely is it attended with pain. Making this statement to several of the younger members of our society, I was asked to "write it up" for this meeting. I do not lay claim to anything new or original, but I do know that I save my patients much suffering, and for this mercy they are truly grateful.

Any process of destroying the pulp, other than that of immediate extirpation, takes time. The action of the various medicaments when applied to it are as follows: irritation, congestion, inflammation, death. The pulp, as we all know, while of fair size in the body of the tooth, gradually grows smaller as it approaches the apex, until where it passes through the apical foramen it is scarcely more than a hair in size. The effect of the article used causes, as I have said, irritation, congestion, inflammation. There is a determination of blood to those parts, the vessels become congested and inflamed, the opening at the foramen is so small that it is closed by the enlargement of the vessels, the circulation is stopped, and the pulp dies from strangulation.

We can readily see that while this is going on, the whole of the pulp cavity being filled by the pulp, the pressure against its walls would be such as to cause intense pain. To guard against this, I always make a free exposure of the pulp before making an application. This gives an opening or vent for relief from the increased pressure. I have used but one thing to destroy the pulp for many years, and that is arsenic. I am aware that many decry it, and attribute most pernicious effects to its use, but so far I know of nothing better, and shall be most happy to change when I do. But I do not use the arsenic of commerce, which, notwithstanding its cheapness, is largely adulterated. I use pure crystal arsenic, and the quantity required is so small that a piece the size of the one I now hold in my hand ought to last an honest dentist ten years or more.

I make a very free exposure of the pulp, for by this means I am able to see it. I do not believe in filling teeth by faith, though we are told in the 10th chapter of Tim., 16th verse, that "faith is the substance of things hoped for." That is all very well; we can *hope* for anything under heaven, but we can not *expect* to accomplish any good thing unless we start right and work right, and to do this it is necessary to see what we are doing.

Having made a free opening, I touch the exposed portion with pure carbolic acid, then take my piece of crystal arsenic, and with a knife or instrument scrape a very little of it into powder. I twist a piece of cotton the size of a pin-head on a smooth nerve instrument, so loosely that it is easily detached; moisten it with carbolic acid and take up as much of the arsenic as will adhere to it, and place it upon the exposed pulp, but without any pressure. I then place a small concave metal disk over it, in such a manner that it rests upon the walls of the cavity, and effectually prevents any pressure upon the pulp. I then fill carefully with gutta-percha, and if there is no pressure there will be no pain. If there is pressure you will hear from it at once, which means to remove and start again.

These disks or caps are about ⅛ of an inch in diameter, and I usually make a quantity by punching them from the thin sheet iron that instrument makers mail instruments in. Do not, to save a little trouble and time, cover the arsenic with cotton dipped in sandarac instead of gutta-percha. It is a slovenly way to work, and it is not safe. I have seen many cases in which the arsenic had escaped from the tooth, destroying the alveolar septum, and not infrequently causing the loss of the tooth itself. In most such cases the dressing had been cotton and sandarac.

I prefer to allow the arsenic to remain five, six or seven days, as then the pulp can generally be removed whole. It does not break and tear, as it will where it has only been allowed twenty-four hours. It is quite tough and leathery, and can be removed with no pain, except where it separates at the foramen. If after three or four days the tooth becomes sensitive to the touch, remove the filling, cap, etc., and it will return to its normal condition in a day or two, when the pulp can be removed. All this takes time, and time is money to a dentist if it is to any one; but take all the time necessary to do work well, and do not forget to charge well for it, for its value can not be overestimated.

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ANTRAL ABSCESS.

BY DR. M. O. COOLEY, NIAGARA FALLS.

Read at the Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York, held in Buffalo, October, 1891.

Before entering into the details of this subject, it may be well to review a portion of the anatomy and physiology of the antrum and the parts associated with it, for the purpose of refreshing our minds.

The antrum of Highmore is an irregular, triangular shaped sinus, situated in each of the superior maxillary bones, with its base facing the nose, and its apex the malar process. The floor of the orbit is its roof, and the alveoli of the molar teeth its floor. Its only opening is a small foramen, starting from its base or nasal aspect and opening into the middle meatus of the nose, and it has as its boundaries portions of the turbinated, ethmoid and palate bones. The size and shape of the sinus varies to a considerable extent in different individuals. In fact, there is often a marked difference in the right and left sides of the same person. It is said that the average sized antrum will contain about one and one-half fluid ounces. It is larger in the male than in the female, having thicker, stronger walls. In an adult it diminishes in size as age advances, or if the teeth are lost. It is not infrequently the fact that there are one or more septa of bone in the floor of the antrum, which in case of disease adds very much to the difficulty of its treatment.

It is lined with a mucous membrane, which is continuous with that of the nose and mouth. The antrum in a normal state indirectly communicates with the frontal sinus, through intermediate cavities known as the ethmoidal and sphenoidal cells, and the mucous lining of the antrum is also in common with these cavities. The mucous membrane lining these sinuses is made up of ciliated cells, a provision of Nature by the means of which the antrum is enabled to rid itself of secretions, which would otherwise accumulate and become offensive. The relationship which exists between the teeth and the antrum has been found by many of us to be a close one, as in many instances the roots of one or more of them penetrate the antral floor.

There are many lesions which the antrum is heir to, but the one most frequently met with is the result of a broken or abscessed tooth, usually a second bicuspid or a first molar. There may not be any great amount of pain in the teeth, but there is a sense of fullness, a pressure in the face, which, as the engorgement increases, becomes almost unbearable. In some cases the eye on the affected side discharges tears freely, and as the pressure from within increases is forced from the orbit, in some cases to a marked degree. A sense of fullness and pain is also very pronounced in the frontal sinus.

With these symptoms in view, the first consideration is to remove the root or tooth, which we will suppose has abscessed, the pus from which has found its way into the antrum. This will usually afford an opening through which the accumulation of pus will find an outlet, whereupon the pain in most cases will subside. But the treatment does not end here; for, until Nature has made the necessary repairs, the secretion of pus will continue, and it is imperative that the opening be large enough to accommodate a tube of gold or silver which shall be at least one-quarter of an inch in diameter. After the drainage tube is in place, a clasp plate should be adjusted to the adjoining teeth, which will serve to keep food from finding its way into the antrum.

In cases in which trouble has existed for some time prior to treatment, necrosis is very liable to be present, and should be carefully looked for. If found present, it is usually near the tooth or root which has given rise to the trouble, and in this location is easily removed by use of the dental engine. If necrosis is suspected of having made any progress within the antrum, a simple means of detecting it is to stuff the cavity full of absorbent cotton, allowing it to remain until it is swollen by the moisture it will absorb sufficiently to fill the cavity in every part, when it may be removed. If there be necrosis, the cotton will pull apart and catch on to the ragged walls of the antrum, as the mucous membrane will be impaired, and there will be an exposed and rough surface of bone to become entangled in the fibres of cotton. However, any one with sufficient experience can, with a probe, readily detect necrosed bone. But I consider the cotton, in the hands of the inexperienced, the safer and more reliable.

Now the question arises, how shall we deal with the necrosed bone? In some instances it may be necessary to make the opening sufficiently large to admit of its removal by surgical means, but in the majority of cases this is not necessary, for by systemically administering a tonic treatment, such as syrup of the hypophosphites, or cod liver oil, with wholesome diet in conjunction with local treatment, which shall be stimulant and disinfectant, the sequestra will be exfoliated and repair will take place without an operation.

The progress made in cases of long standing is often very slow, sometimes requiring several months of careful and persistent treatment; while those which are taken in hand in the early stages are far less obstinate, and the possibility of effecting a permanent cure is proportionally more flattering. I have no doubt if we were to examine the sockets of all the superior first molars we extract, the number whose roots are found to perforate the floor of the antrum would astonish us, and we would marvel that there are not more cases of this affection. I am led to believe that in not one case in ten does antral abscess follow the extraction of a tooth whose roots perforate the floor. The temperament, general health and recuperative power of the patient, have a very strong bearing on this point.

Nasal catarrh offers serious resistance to the treatment of what might otherwise be simple cases to handle, especially in this damp climate. Owing to the catarrh, the mucous membrane of the nose becomes hypertrophied, closing the natural outlet of the antrum, thereby rendering it impossible to close the artificial opening. Moreover, the inflammation is more difficult to control. It is well understood that an inflammation once begun in the mucous tract has a tendency to spread and involve other organs having the same lining. For example, a child who is erupting teeth may have an inflammation of the gum tissue surrounding the tooth about to erupt, which is at first circumscribed. Gradually it may become diffused, affecting the mucous membrane of the mouth and fauces, and in some instances the whole mucous tract. The mucous membrane of the antrum bears a similar relation to that of the nose. It is low in vitality as a result of abscess, and has no power to resist the spread of the inflammation from the nose. As a consequence, we have a very stubborn lesion to deal with.

In his system of Oral Surgery, Dr. Garretson states that "The antrum once fully and fairly opened in the floor region as the result of disease, the practitioner is not to be too ready to attempt its closure. Once fairly exposed by a break in its floor, the antrum never again physiologically voids itself through the nose, because from the degenerated condition of the membrane the cilia will have lost their office as a result of the disease that caused the opening."

This statement does not apply to cases in which teeth have been extracted whose roots have penetrated the floor of the antrum, where no disease existed prior to the extraction of the tooth, for as a rule these cases will readily close provided the outlet into the nose is unobstructed. Hence the importance of getting the catarrhal affection under control at the earliest time possible. Situated as we are in the Lake Region, with its damp climate, catarrh is more or less prevalent, and anything like a permanent cure is to be obtained only by going to a higher and dryer place. I have just been treating a case of this character, and my efforts were unavailing until such a change was made, when improvement began, and in a short time the trouble was apparently over. When patients present themselves for treatment they are usually more or less run down systemically, as the result of suffering, loss of sleep, absorption of pus and the consequent loss of appetite. They should be placed under tonic treatment, as before described, and should take plenty of exercise in the open air. Their diet should be that which is most wholesome and nutritious. In the local treatment of this condition cleanliness is of first importance. The chances of recovery are far more encouraging where cleanliness alone is observed, than where the most skillful medication is practiced without regard to cleanliness.

The remedy for cleansing purposes which has proven most efficacious in my hands is Marchand's per oxide of hydrogen, thrown into the cavity by means of a syringe. This should be followed by injections of a solution of sulphate of zinc, one or two grains to an ounce of water. If there should be much pain, one or two grains of chloral may be added to each ounce of the solution. There are other remedies which may be equally good, such as a mild solution of carbolic acid in glycerine and water, and Listerine, used with an atomizer. Some practitioners advocate the use of sulphuric acid, creosote, nitrate of silver and other escharotics. There may be cases in which these are indicated, but experience of others has taught me that they do more harm than good. Antral abscess, like chronic periodonitis, demands slow and persistent treatment with mild, soothing medicaments. But in all cases it must be remembered that thorough and persistent drainage is the first essential. Until the antral cavity can be kept clean and made aseptic, there is little use in the attempt to employ remedies for the curing of the diseased condition. While the degenerated products of disease remain, they will perpetuate the condition, and a return to a healthy state will be impossible.

MURIATE OF COCAINE CRYSTALS AS AN AID IN REMOVING PULPS.

BY DR. C. W. M'CALL, BINGHAMTON.

Read at the Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York, held in Buffalo, October, 1891.

The dentist often finds it necessary to extirpate a live, or partially live pulp, when for various reasons the operation can not be postponed to a future sitting, as must necessarily be the case if an application of arsenious acid were employed. For crowning purposes this is sometimes necessary; or perhaps a tooth when first presented may have already been treated with arsenic, and, the coronal portion of pulp having been removed, the canal portions are found to be still highly sensitive. A second application of arsenious acid in this particular case may be impracticable.

The same annoyance is experienced when, after removing the bulbous and perhaps part of the canal portion of a gangrenous or suppurated pulp, the apical end is found alive. In any of these instances, the operator as well as the patient shrinks from the ordeal. But immediate removal seems imperative, and some very heroic operating must be done, which few patients have the physical stamina to endure without the aid of a suitable obtundant.

The use of cocaine to obtund sensitive dentine, with its discouraging results, is so emphatically a hackneyed subject that I fear the bare allusion will draw a smile of incredulity from many who have, as they believe, a well-founded prejudice against it. Its superficial application to the live pulp in the various per cent. solutions has not been effective in my hands, and while no claim of infallibility is made for the use of crystals, their easy and painless application and usual efficiency is the excuse I offer for relating my own experience with this really practical method of eradicating live pulp tissue, which in twenty-five out of thirty cases has been successful.

Assuming that the pulp to be operated upon is fully exposed, either through the action of caries or artificial means, the careful placing of a crystal of cocaine against it will cause not the slightest pain if applied with a stiff probe, the end of which is just moist enough to cause a crystal to adhere. Almost immediately after withdrawing the probe the crystal dissolves, owing to the natural moisture of the pulp, and in a moment more crystals may be placed in contact with the now obtunded pulp surface, free access to which should be obtained by a few careful draw cuts with a small hoe or spoon-shaped excavator. The probe should then be exchanged for one with a thin, slim neck, and a sharp point, which, after being bent to the proper angle, is cautiously introduced through the orifice and around the sides of the coronal portion.

In some cases the patient will experience pain as soon as the probe is introduced into the pulp, in which event more crystals are added, and a moment or two allowed to elapse, when a second trial should be made. As soon as the patient evinces no pain the probe is slowly worked up and down, making different tracks through the bulbous portion, thus injecting the concentrated cocaine through every part. In from one to five minutes all the coronal portion may be scooped out with a spoon excavator. After wiping out the debris, the root contents may still be found sensitive, and in order to obtund this always troublesome portion of the dental pulp, it is only necessary to follow the same insinuating process that has been described with reference to the coronal portion. This applies to pulps which have been only partially removed through the aid of arsenious acid.

In single rooted teeth this insinuating process may usually be carried throughout the root portion, care being exercised to convey the probe around between the pulp and canal wall first, and then gradually through its entire substance.

In conclusion, I believe that this method of using cocaine has saved patients much suffering which was formerly unavoidable at my hands, and has simplified an operation which at times seemed to baffle my best efforts.

OBSCURE PAINS IN AND ABOUT THE JAWS.

Abstract of a paper by Prof. Garretson. Prepared expressly for this journal.

In the *International Dental Journal* for January, will be found an interesting paper by Dr. J. E. Garretson, upon obscure pains in and about the jaws, read before the New York Odontological Society. The essayist defined pain as altered sensation, and obscure pains as those the causes of which were only partly evident, or not evident all. But as there must be a cause lying back of every pain, it follows that the term obscure pain resolves itself into one of ignorance of cause.

But pain is only a symptom, and sometimes the cause of it is so hidden that only an autopsy can reveal it. In the museum of the College in Philadelphia, is the skull of a man who suffered untold agonies during life from a neuralgia affecting all the branches of the right trifacial nerve. No clear diagnosis of the case was ever made, nor was the man ever benefited by any of the many means employed. After death it was found that a spicula of bone grew from the border of the oval foramen and pierced the body of the nerve.*

Recently a case was presented of a young man from a distant state, who was suffering from a trouble situated near the maxillary tuberosity of the upper jaw. There was little unusual to be seen, except an undue broadening of the part. A cut was made through this, and there was found an anomaly that the essayist had never met with before—a supernumerary wisdom tooth.†

Another case was that of a patient who was said to have cancer of the upper jaw. Examination revealed a condition very much like that of sarcoma. But after two or three visits this soft and offensive mass was scraped away, and there was found in the nasal process of the upper jaw a long cuspid tooth. This was extracted and the man soon recovered from his cancer.

A case was recently presented in which the superior maxillary was seen to be very much enlarged externally. But examination showed the jaw to be entirely without teeth. On opening the antrum of one side, however, five teeth were exposed.

The most common cause of pain in the jaws is odontalgia, or toothache, due either to exposure of the pulp, to peridentitis, to sensitive dentine, to confinement of pus or gas in a closed pulp-cavity, to the pressure of granules of osteo-dentine in the pulp, or to the recession and absorption of the gums and alveolus, These are common, every-day causes, which fall under the continual observation of the dentist. Some of them may be almost unerringly diagnosed, while others, like granules in the pulp, are obscure.

Next after these as causes of pain in the jaws, should be placed syphilis, in its tertiary form, and undeveloped teeth. Of this last cause the most common will be found to be: first, the wisdom teeth of the lower jaws; second, supernumerary teeth; third, anomalous or unique growths.

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* It will be remembered that the third, or inferior maxillary division of the trigeminus, or fifth pair of cranial nerves, which contains the filaments from the second, or motor root, emerges from the cranial cavity through the foramen ovale.—[EDITOR.

† It is sometimes the case that a fourth molar, bearing the same relation to the other molars that they do to each other, is found in man. These do not present the same appearance that the so-called supernumerary teeth do, but give an air of vraisemblance to the theory that they are returns to what Darwin called "ancestral conditions." In other words, that they are reappearances of a suppressed fourth molar. Such teeth are not uncommon in the gorilla, the nearest approach to man in dentition.

Prof. Garretson is too competent an observer to make a mistake in this matter, and he pronounces this tooth unmistakably a "supernumerary."—[EDITOR.

Next in importance are cachectic conditions of children, the discomfort being caused by a loose relation of the teeth with their sockets. The diagnosis in these cases is not difficult, as the cachectic condition plainly indicates it.

A dull, heavy, demoralizing kind of pain, situated in the region of the cheek, is sometimes met with, whose cause lies in the closure of an artificial opening into the antrum that has existed for sometime, and in which inflammatory change has destroyed the peculiar ciliated structure of the mucous membrane lining the cavity, thus permitting the lodgement and subsequent disorganization of the secretions. The essayist has had patients come thousands of miles to consult him, when the whole fault lay in the attempt of the dentist or physician to close an artificial break in the antrum; not the slight ones made in extracting teeth, for such usually heal of themselves, but those in which there has been a degeneration resulting in the loss of a portion of the floor of the antrum, through the throwing off of a sequestrum. Whenever an antrum has been open for sometime, and there has been a general inflammation about the parts, he always advises keeping it open.

The specific inflammation, erysipelas, when appearing upon the face, will cause a pain about the head and jaw, situated principally over the malar bone. The parts are sore upon pressure. Nothing is to be seen in the mouth. After a few hours the blush of erysipelas appears. This will yield to a direct application of the following, frequently painted on the parts until the red blush disappears:

℞—Tinct. ferri chlor,	℥ j
Quiniæ sulphatis,	ʒ j
Tinct. cinchonæ,	ʒ ij

—*M.*

Malarial pain finds expression in a lack of comfort about the teeth that is not easily described. There is an uneasy sensation about these organs, but an examination finds them, perhaps, perfect. A diagnosis is not readily made, except through exclusion. If no other cause can be found, it may perhaps be ascribed to malaria.* In such cases there is, upon the part of the patient, a sense of depression and malaise—not absolutely sick and not entirely well. Anti-malarial treatment will soon verify or dissipate these suspicions.

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* The term malaria is too often used as a cloak for ignorance. When a patient gives evidence of a malaise the etiology and pathology of which are not comprehended by the physician, and when the latter has received fees long enough and desires to get rid of the troublesome case, he pronounces it malaria and orders a change of air. It is to be hoped that dentists, in attempting to follow the advice of so competent a teacher as Prof. Garretson, will not fall into the same error—at least that they will not call the toothache malarial without something definite upon which to base their opinion. Better have another think at the case first.—[EDITOR.

Neuralgic pains are various in their origin and manifestations. The most common seat of them is the supraorbital region and the parts lying back of it. Such pains are commonly due to eye-strain, because of some abnormal condition of the eye or its muscles. The pain will frequently manifest itself in the teeth. The essayist has met with a number of cases in which neuralgic pain was due to insufficiency of the recti muscles of the eye. The patient, perhaps, could focalize well, and could read with facility. Accommodation was all right, but after reading for a while the letters began to blur and neuralgic pains manifested themselves. In such cases the difficulty may quite likely lie in muscular inefficiency.

Perhaps one of our own profession has worked untiringly, with unaffected sight, for years. Finally he finds himself unable to operate more than half a day at a time, without great nervous strain and fatigue. He feels that his power is leaving him. Neuralgic pains begin to manifest themselves in the supraorbital region, and life ceases to be a pleasure to him. In such cases it is more than likely that the trouble is due to a presbyopic condition. He needs a plus lens for his eyes, and should at once have them tested.

Once the speaker received a visit from a surgeon of the United States Navy, who had come home from China under the impression that he had softening of the brain. He had consulted many surgeons in the east, who had given him no relief. The pain was continuous. An examination revealed nothing that might aid in a diagnosis, save one of the most beautifully filled bicuspids that he had ever seen. He extracted the tooth and the pain was instantly and finally gone.*

Inflammatory thickening of the inferior dental nerve always presents a certain easily observed tumidity of the gum tissues overlying the bone. If this is of a persistent character, the indication is for the exposure of the nerve in its canal, and its removal. The pain in these cases will be located within the lower jaw, or along its body.

A case came under the care of the speaker, of a man whose suffering was so great that he would run around the streets of the village in which he lived screaming with agony. Seven operations were made for him without relief. Finally he knew nothing more to do for him, save to remove the jaw entirely. The patient begged to be either killed or cured, and he took out the lower jaw, since which there has never been a twinge of pain.†

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* It would seem that a man with the extensive medical, surgical, and dental experience of Prof. Garretson, might have found some other refuge in such a case than that confession of failure — extraction. But he was probably looking at it from a surgical rather than a dental standpoint.—[EDITOR.

† It is not easy to see how there could be any further neuralgic pains in *that* jaw.—[EDITOR.

A gentleman once came to the essayist with such a pain in the eye that he declared he would shoot himself if not cured. He had searched for relief in the chief cities of Europe. When he came to the office, and while describing his suffering, he would perhaps be seized with a paroxysm, and would suddenly jump up and crawl under the table, screaming with pain. He had been in hospitals without number, and all to no effect. The essayist went all round the circle of possible causes, without any clue to a diagnosis. Finally he began the use of atropia in the eye, to contract the iris and allow him to see the interior of the eye-ball, but with no more effect than though it had been applied to a brickbat. He made a stronger and yet stronger solution, and persevered in its use for weeks and finally secured moderate contraction and discovered a cysticercus.*

He watched the case with much interest, not being disposed to pronounce upon it until he was very certain. But one day he found it boring into the crystalline lens, when he removed the parasite with the effect of a radical and complete cure.

Neuralgia along the line of the temporal artery is always associated with the auriculo-temporal nerve. In the opinion of the speaker, this may almost universally be attributed to exhaustion. It is a rare pain in men, but is of comparatively frequent occurrence in weak, over-worked store-girls and clerks.

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THE OFFICE OF THE LEUCOCYTES.

Abstract prepared expressly for this journal.

Dr. Armand Ruffer has lately given a lecture before the Royal College of Physicians and Surgeons, in London, upon the destructive action on micro-organisms of the leucocytes or phagocytes, the amœboid white blood corpuscles. He believes that the microbes in living tissue are destroyed by these cells of the body, and by these alone. He has been conducting a series of experiments with a specific bacillus and claims to have established certain facts. He used rabbits, which have immunity from the effects of that pathogenic bacillus, and he reasoned thus: —

If this immunity is due to the fluids in the rabbit's body not furnishing sufficient nutritive material for the growth of the bacilli, then they should not appear at all, or very sparingly, at least.

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* The encysted larval form of tænia solium, the common tape-worm. It is usually found in the connective tissues, but it may penetrate even to the brain. In this case the cysticercus was in the aqueous humor without doubt. Had it been in the vitreous, or attached to the choroid, according to the best authorities no operative measures would be admissible, except enucleation of the whole eye.—[EDITOR.

If it is due to some bactericidal power possessed by the fluids of the rabbit's body, then degenerated bacilli should be found near the point of inoculation.

If the resistance is due to the physiological action of the rabbit's cells, and not to the action of the fluids, then the bacilli should grow freely in the fluids but degenerate in the cells, and would be destroyed by the leucocytes.

In guinea-pigs, the bacillus used grows very freely, and they are extremely liable to the disease. Dr. Ruffer found that in both rabbits and guinea-pigs the bacilli commenced growth as soon as introduced, and that the leucocytes were at once attracted to the spot, he believes, by the chemical poisons or ptomaines which are the result of the growth of the micro-organisms, and that the latter were taken into the interior of the leucocyte cells and destroyed. This cellular immigration at the point of infection varied inversely to the quantity and strength of the virus introduced, but was in proportion to the duration and curability of the disease. Thus, if a large quantity of bacilli were introduced into an animal subject to the specific disease, there was little immigration, and the animal invariably died.

This was demonstrated by enveloping the virus in filter paper and introducing it under the skin. The fluids could then have access to the bacilli, while the amœboid cells were excluded. Then when the paper was removed there was opportunity for the leucocytes to attack them.

When the virus was injected directly into the blood stream of a susceptible animal the disease progressed with appalling rapidity, and if, as a consequence of an infection, the bacilli had commenced to proliferate in the blood, the leucocytes would no longer migrate. If, for instance, the virus was injected into a rabbit's eye, the cells migrated there in great numbers; but if the poison was already circulating in the blood, they no longer left the blood vessels.

If, however, another organism was now injected, the leucocytes immediately emigrated to attack that. So, if an animal were already suffering from anthrax poisoning, the leucocytes declined to attack anthrax bacilli, but immediately took to any other pathogenic organism that might be introduced.

From this, Ruffer deduces that, as long as the poison which was the effect of the growth of the micro-organisms was outside the blood vessels, the leucocytes would pass through the walls and attack the organisms; but when it penetrated to the blood, the leucocytes were either paralyzed or some change took place in the coats of the vessels which prevented their leaving them, even though they existed in plenty in the spleen.

THE TWENTY-THIRD ANNUAL UNION CONVENTION OF THE FIFTH, SIXTH, SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

(Continued from page 33.)

A paper was read by Dr. Frank French, of Rochester, upon "The Treatment and Destruction of the Dental Pulp." (This paper will be found in full on page 73.)

Dr. C. S. **Beck**, of Wilkesbarre, Pa.: The treatment I have pursued is very much the same as that recommended by the essayist, but the preparation of the arsenite has been a little different. It is pure oxalate ground in creosote for three hours, when twenty grains of the crystalline oxalate are added to twenty grains of sulphate of morphia. This is to overcome the pain created by the oxalate of arsenic. I have destroyed very few pulps. I believe I have made such an application but once in three years. I do not claim I am any more successful than my brethren, but I think perhaps we sometimes censure gentlemen who have difficulty with pulps a little too severely. I will acknowledge there are but very few pulps that have been capped which are not injured. As this is a very important point in the practice of dentistry, I would like to hear the experience of every gentleman in the room.

As concerning the time allowed for destruction of the pulp tissue, I let it remain from forty to forty-eight hours. It depends upon conditions. If inflammation has been present to any great extent, I think it is perfectly useless to apply any destructive drug to the pulp. What effect arsenious acid has I am not prepared to say. I doubt a great many things I have heard said about arsenious acid. I do not think it good practice at once to apply arsenious acid to an inflamed pulp.

A **member**: I would like to ask in what manner Dr. Beck proceeds.

Dr. **Beck**: I apply the rubber dam invariably, and open the cavity up freely, that I may see as far as possible in removing the disintegrated tissue. I then use a bath of warm water, of about the same temperature as the mouth, and cleanse it out thoroughly. If there is but a slight degree of inflammation, almost any remedy that will reduce inflammatory action may be used. Sometimes I use a solution of iodine and cocaine, sometimes I use oil of cloves, depending upon the condition. I would not specify what I would employ in any particular case until I see it. A very good remedy, if there is a high degree of inflammation, is a strong tincture of aconite.

Dr. **White**, of Phelps: We have learned the method of treatment followed by Dr. French. I can heartily endorse it from personal experience. I suffered intense pain from an exposed pulp, and at last treated the tooth as described in the paper, after which I suffered no pain whatever, while the tooth was killed and there was no trouble with it afterwards. I have followed the same course in my practice, and in each case the result has been more than satisfactory.

A MEMBER: Does Dr. French consider it essential to put on the inverted disks?

Dr. FRENCH: I do.

A MEMBER: Suppose you should use arsenic without the disks?

Dr. FRENCH: Then you would get pain.

Dr. HOFHEINZ, of Rochester: Regarding the inflammatory conditions, I have found that puncturing the pulp tissue answers every requirement. I have used arsenious acid prepared in the pure condition recommended by Dr. French; but some years ago Dr. Truman, of Philadelphia, recommended a preparation which is the most successful that I have ever employed.

It is equal parts of arsenious acid, iodoform and carbolic acid. It has often been argued that sometimes arsenic will not destroy certain pulps. That four or five, or even more, applications have been required. I have had such cases, but it is not the fault of the arsenic or the pulp, but the result of not cleaning the cavities sufficiently.

Dr. G. L. FIELD, of Detroit: I arrived late, but I understand the subject under discussion to be the destroying of pulps. The gentleman upon the floor when I came in, made the statement that before his application of arsenious acid he first ascertained that there was no inflammatory complication; he would not use it as long as there was any inflammation of the pulp.

THE PRESIDENT: That is the interpretation that I placed upon his remarks.

Dr. FIELD: I came down here to learn something of the business. I live away out in the woods of Michigan. I want to know the reason why these gentlemen would not use arsenious acid, or whatever agent they might employ, while there is inflammation. I always thought the arsenious acid was to produce inflammation, and that this resulted in strangulation of the pulp. Now, if it be the fact that there must be no inflammation to commence with, but that it must be induced by the arsenious acid, and if strangulation is the cause of the destruction, I arise to ask the gentleman why he will not then use arsenious acid.

Dr. FRENCH: In reply to the gentleman, I will simply say that if there is inflammation of the pulp tissue, what is the use of applying arsenic to increase that inflammation? It takes but very little to strangulate the pulp tissue. When pulps present themselves in an inflamed condition I do not think the absorbent vessels would act, and that is why I would not apply it.

Dr. Barrett: I believe that the pericementum which surrounds the teeth, from all the testimony of which I have any knowledge, is the organ that gives it its blood supply; that it is a kind of placental organ, and gives it the nutrient currents, and in the case of young persons this is not altogether through an open foramen.

The arteries and veins cannot be traced beyond the pericementum. The illustrations in our text books, and in the anatomical preparations artificially prepared, always represent an artery and vein passing out at the apex of the tooth through an open foramen, traversing the tissue beyond the pericementum until they anastomose with the general venous and arterial circulation. I do not believe that any one ever saw such a condition. I do not believe that either veins or arteries go beyond the pericementum, but are distributed to it. I have examined many growing teeth, and I never saw anything different. The pericementum is an exceedingly vascular tissue, and in young and growing teeth it gives off little twigs of arteries, which may penetrate—not alone at the apical foramen—but through the sides and walls of the root of the tooth anywhere. I have demonstrated a dozen such entering through the dentine and cementum, and thus forming a kind of Haversian system of blood supply, analagous to that of bone. As the person grows older these may, and usually do, close up with the addition of dentine, until in age, perhaps, the only supply left is through the apical foramen. This foramen I have never found to be a round hole such as is represented in the text books, but a kind of delta, especially in early life, with two or more openings. Perhaps I had better not say that it is never single in young teeth, but I believe that it is seldom so. Examine a young tooth in which the apical end has just formed, and see if it is not as I say. Before the development of the whole of the root, of course there is no foraminal contraction.

That the condition usually represented in the text books and models can not be the true state of the case, is proven by the fact that a number of competent observers, men like Dr. W. W. Allport and Prof. Brophy, of Chicago, have assured me that in certain instances of diseased or traumatic conditions, they have repeatedly swept an excavator completely across beneath the roots of the teeth, without meeting with either artery, vein, or nerve, and yet the pulp was quite alive, and after healing of the lesion there were unmistakable evidences that the tooth was not devitalized. Indeed, in one such case devitalization of the pulp was accomplished sometime afterwards, on account of subsequent decay.

What do I infer from this? That blood stasis is not that which produces the death of the pulp, but that the arsenic has a specific escharotic effect, and that it destroys the pulp precisely as it will destroy any other vascular tissue to which it is applied. You know that if you do not carefully seal the arsenic within the tooth cavity, and that if it escapes and comes in contact with the buccal tissues, it will corrode them and produce an arsenical ulcer. It will destroy the pulp of a tooth whose root is but half grown, in which there is no contraction into an apical foramen, and in which, consequently, there could be no stoppage of circulation by inflammation and blood stasis at the tooth apex. It destroys the buccal tissues, where of course there can by no possibility be any strangulation at a contracted foramen. When that most miserable preparation, sandarac solution, is used for sealing up the cavity, you know that sometimes arsenic, if used in unnecessarily large quantities, will escape and come in contact with the tongue and erode that. I have seen such instances. Indeed, sandarac is apt to encapsule the arsenic and prevent its coming in contact with the pulp, but will allow it to escape into the mouth after the dissolving out of the gum.

Let me repeat, that I believe that very seldom will it be found that in young and growing teeth the foramen is a single opening, but that it is a kind of delta, and that something that is analagous to the Haversian system in bone may be observed in dentine, not infrequently forming a circulatory communication between the pericementum and the pulp. In old age this is modified by further calcification, the same as in bone. This is the reason why it is sometimes very difficult to devitalize certain pulps. This is also the reason for the sometimes exceedingly sensitive points found at the side of the pulp canal, between the pulp chamber and the apex. It also explains the intractability and incurability of certain alveolar abscesses. The infected point is not at the apex, but somewhere along the side of the root, where was the entrance of one of these "Haversian" canals. In bicuspids, with two distinct roots, and in molars, it is not infreqeuntly at the bifurcation of the roots. Have you not often extracted abscessed teeth and found the seat of the disturbance between the roots? The point of infection is where a blood supply was given off to the pulp. Usually in grown teeth this is at the apical foramen, and there will be found the seat of the abscess. But in young teeth, and sometimes in the teeth of older persons, a blood canal enters the pulp at the bifurcation of the roots, or along the sides of the root, and this may be the seat of the abscess. The usual injections of remedies may not reach these points, and hence they are difficult of cure and form those instances in which you find it impossible to get the results you have the right to expect.

Sometimes this may account for the failures met with in so-called immediate root filling. When these points can not be reached by the detergents and germicides in any other way than by the gradual absorption of remedies, it can readily be seen that the filling of a root, leaving these infected points unsterilized, would be likely to result in after complications of a more or less serious nature.

Dr. GREEN: Would you advocate a different treatment for young people and old?

Dr. BARRETT: Certainly.

Dr. FIELD: I think sandarac varnish one of the finest things that can be used. That shows how great minds may differ. It can be put in with absolutely no pressure at all.

Dr. STAINTON, of Buffalo: I cannot understand why Dr. French uses carbolic acid first, for that produces only a carbolate of albumen. It will help certain conditions of pain. Nine cases out of ten are inflamed, and when I began practice that was the teaching, that you must not apply arsenic until you had reduced the inflammation. I have found that sometimes arsenic will reduce the pain. It may fire it up a little harder for a hour or so, but that is the shortest way out of the trouble.

I believe that Dr. French is correct in his use of disks. I do not think that Dr. Field is sound on the sandarac varnish question. I cannot put in such a dressing without the liability of the arsenic to escape and erode the soft tissues. Ordinary bees-wax acts most kindly as a stopping over the arsenic, every time.

THE PRESIDENT: I find myself in a very embarrassing position here. It has been my custom in dental meetings to jump to my feet on all occasions. I had resolved to curb myself here and to confine myself to the duties of my position, and not to talk when it is my business to listen. But I want to say a word about this discussion. If arsenic is given to a root and it swells up pretty big—and every pulp that I ever extracted looked to me as if it had been through the same process,—it does seem to me that stasis is the result of arsenic and inflamed pulp. Dr. Field asked why it was necessary to apply anything to reduce inflammation. Arsenic produces inflammation, and if there is inflammation it doesn't take hold, and you don't get complete strangulation, and the appearance of the pulp has indicated that in cases where you did not accomplish the result with one application of the arsenic it was when the foramen or foramens were such that complete stasis could not be produced. They were poorly calcified teeth.

Dr. DUNN: I wish to ask if it is not stasis, or if it is stasis, why it is that we sometimes find a pulp has died, or death has taken place in the upper portion of it, and we can handle it just as we please, while probably half way up the roots we run across some very lively tissue? Now, if it was stasis, why wouldn't that pulp be killed clear to the foramen or delta? Why would it choke off the upper portion of it and not the lower portion? I really believe myself that it is the escharotic effect of the arsenic that produces death of the pulp.

Dr. FIELD: Why is it that the escharotic effect will destroy the pulp in a tooth in which the foramen is not yet formed? It is because you can not produce the strangulation that you can where the foramen is whole.

Dr. W. W. COON: Arsenic is an ingredient in the plasters which the cancer doctors use to eat out the diseased tissues. It is not the strangulation that causes the corroding action that takes place there. Arsenic seems to have an affinity for affecting tissues. It surprises me that arsenic should be left in contact with the pulp for five or six days. I leave it in as much as twenty-four hours, and in grown persons forty-eight, and when I leave it longer I have noticed a bluish color, and I should think it would always be present when a larger quantity was left in four or five days. Hasn't Dr. French ever found that discoloration takes place very quickly?

Dr. FRENCH: I would like to know what arsenic has to do with the discoloration.

Dr. COON: Destruction and decomposition of the tissue and the absorption of it may produce it.

Dr. FRENCH (closing the discussion): I don't know that it is worth while to take any more time. My friend on my right thinks the pulp does not die from stasis, because when applied to other tissues they do not die from strangulation. But the pulp is confined within a cell, and hence may die from strangulation when in other cases it would not. I have not used wax. I have dropped that. The reason for applying carbolic acid was simply for sedative effect. I don't think the bluish color is more likely to come from leaving arsenic in six days than from leaving it one day. Sometimes in applying arsenic to teeth where there is no exposure of the pulp you will find not the bluish color, but you will get red, which I do not think you will get if it is not exposed.

A paper was read by Dr. M. O. Cooley, of Niagara Falls, upon "Antral Abscess." (See page 75.)

THE PRESIDENT: I will call upon Dr. Barrett to open the discussion upon this paper.

Dr. BARRETT: The antral cavity is of the same general character with those existing in other bones of the face. These cavities have a number of uses. In the first place, they make the bone lighter, while they afford the same contour. Perhaps their main use is in giving resonance to the voice. All the closed cavities of the body are lined with serous membrane, while those that are open have mucous lining. As the antrum of Highmore communicates with the nasal cavity by an opening beneath the middle process of the turbinated bone, of course it has a mucoid membranous inner surface.

Its form, size and position varies with different persons, and this it is which presents the greatest embarrassment in its treatment. One does not always know exactly at what point its lowest depression may be found. Still, the contour of the bone will be a usually reliable guide.

The diseases of the maxillary sinus have been made a great bugbear to dentists. Really, in the absence of any serious complications with other tissues, they are of the simplest character and are very easily handled. If there be atresia of the turbinated opening, this may require an operation. But the usual pathological conditions are those disturbances common to all mucous surfaces. In a catarrhal condition of the Schneiderean membrane lining the nasal cavity, and with which the lining of the antrum is continuous, there may arise hyperæmia by mere contiguity of tissue. This may result in a disorganization of the mucous surfaces and a degeneration of the mucous secretions, until a catarrhal condition analagous to that of the Schneiderean membrane exists.

Usually the cause of antral trouble is from the penetration of the floor of the antrum by the root of a bicuspid or molar tooth. If, then, abscess of the apex of this root supervenes because of decay of the tooth and death of the pulp, the abscess exists within and will break in the antrum. This may infect the whole surface of the membrane, and a muco-purulent condition may ensue that will resist treatment as long as this irritating root remains.

The treatment of a catarrhal condition of the mucous membrane of the antrum consists, first, in establishing a thorough drainage at the lowest point. The best place to make an artificial opening is through the socket of a bicuspid or molar root, and the opening should be of good size. Then cleansing injections should be used, these to be followed by mild antiseptics and stimulating astringents. It should be remembered that an opening which is the result of disease is very rarely if ever closed by bony growth.

As regards the use of peroxide of hydrogen recommended in this paper, my advice is to go slow. I once injected that remedy into an antrum in which pus was present, and I nearly blew the man's head off by the effervescence that ensued. For a few moments he thought he was a balloon and would soar aloft. Use it considerably diluted, for the first time, at least.

Dr. Barrett then spoke of the examinations that he had given of skulls of Mound Builders, which were in the possession of the Academy of Natural Sciences, here in the city, and invited the Convention, as a body, to visit the rooms and examine them.

Dr. **Southwick**: I never had but one case of antral disease that was serious. A workingman came with an abscessed tooth which had almost crowded his eyeball out of its socket. I relieved him but never saw him afterwards. His folks thought they could cure it by poulticing, but he is resting at Forest Lawn Cemetery now. The case had been neglected until necrosis had extended clear up the walls. The membrane on the inside of the antrum was gone, and I had my doubts of the man being cured. He lived only a few weeks after I saw him. Evidently all that this kind of case needs is a mild treatment, cleansing and giving it an opportunity to heal. I think as Dr. Barrett does, that you want to be careful about using peroxide of hydrogen.

Dr. **Cooley** was called upon to close the debate and said: I do not know that any remarks are necessary. I hoped to hear the question discussed by others present. Some cases are simple, and those I don't care so much about, but other cases running along five or six years are obstinate and require attention.

STOMATOLOGICAL CLUB OF BUFFALO—MARCH MEETING.

Reported expressly for this journal.

A regular meeting of the Club was held in the Library of the Society of Natural Sciences, on the evening of March 8, 1892, the vice-president, Dr. A. P. Southwick, in the chair. The minutes of the previous meeting were read by the secretary, Dr. Birdsall, and declared approved.

A paper upon "Rubber and the Process of Vulcanizing" was read by Dr. W. C. Barrett. (The paper will be found in full on page 59 of this number.)

DISCUSSION.

Dr. M. B. **Straight**: The essayist is to be thanked for a concise description of caoutchouc, its origin, properties, preparation for various uses, and the more common adulterations of it found on sale in the markets of the world. The consideration and discussion of it may be of value to the stomatologist from the fact of its extensive use in the human mouth. It is very evident that the essayist has purposely avoided anything in this direction, and I for one am grateful for a chance to float my little canoe before the big craft come along and take the wind out of my sails.

The maintenance of a normal, healthy condition of the tissues of the mouth, is dependent upon several physical requirements, such as exercise (obtained by the natural use of the mouth in the mastication of food), ventilation, temperature, and the normal aseptic condition, influenced by the salivary secretions, assisted by an occasional exposure to the atmosphere and the drinking of liquids.

The stomatologist investigating the mouth will be interested in observing certain detrimental effects, due to the efforts of the dental profession to supply the loss of some of the natural organs, to efforts in regulating malposition of teeth, supplying obturators, and in various other operations of the dental and surgical profession. In all mouths thus supplied with artificial appliances, will be observed more or less variation from the normal health of the tissues. It is unavoidable. Yet, notwithstanding this fact, it is often desirable, and at times really necessary, that mechanical appliances be supplied, and rubber is the most common material of which they are made. The detrimental effect of its use in the hands of careless and ignorant persons can be noticed almost any day. Pure caoutchouc, properly prepared, causes less harm than an impure, poorly prepared article. Rubber dam, as used by the dentist, probably has but little influence, in a mechanical way. Whether the chemicals used in preparing it may cause any pronounced effect, I am here to learn, if any member can enlighten us. When rubber is to be used in the mouth, that which is pure and properly prepared should be insisted upon, and hence the importance of a full understanding of the subject. If rubber dentures are made, they usually cover up and enclose portions of gum tissues, and lie adjacent to the surrounding tissues of the cheek, lips and tongue.

In improperly constructed appliances, there is an irritating mechanical injury to various tissues. All porous portions are readily contaminated by sepsis. When tissues of the mouth are covered up by an appliance, they are not subjected to the same changes in temperature and to the modifying action of the different articles taken into the mouth, and hence we find these tissues in a different condition from those which are exposed.

Whatever harm may arise from the chemicals used in admixture with caoutchouc, I am here to learn about, and I hope some stomatologist may be able to give us information.

Dr. S. ESCHELMAN: I would like to ask a few questions concerning the porosity of rubber. I was at first under the impression that this was caused by gases, and that to prevent it, the temperature should be very carefully and slowly raised. Further consideration of the subject had caused me to modify my views somewhat, and to adopt those of Dr. Southwick, that the sponginess is caused by burning. If, as the essayist says, the temperature be gradually raised, it is possible that the gases may escape, and thus the whole be homogeneous. Still, we do know that too high a temperature is injurious to rubber, and that the higher the point to which the piece is raised the greater the liability to porosity.

Dr. W. C. **Hayes**: I would like to ask Dr. Barrett whether the manufacturers of rubber can control the evolution of the gases completely? Some kinds of rubber are very liable to this porosity. Is it something that the manufacturers could avoid if they would?

Dr. **Barrett**: If the gum used be perfectly pure and properly cured, probably there will be no porosity unless the temperature be raised sufficiently high to actually burn it. But if it contain any substance whatever, that will decompose at the vulcanizing temperature and give off a gas, it will probably be porous when done, from the permeation of the gum by this gas and its "fixing" in that state. It is for exactly the same reason that the housewife's bread is "light," or porous, through the evolution of carbonic acid gas during the "raising" process, and the "fixing" of this spongy dough by the subsequent baking.

Dr. **Hayes**: I have found that of two lots of rubber from the same manufacturer, and that were vulcanized at the same temperature, the one turned out porous, while the other was not. Perhaps there were bad pieces in the rubber, or perhaps some gas-giving substance had accidentally become incorporated with a single sheet.

Dr. H. A. **Birdsall**: The paper is such a presentation of facts that may not be disputed, as leaves little chance for discussion. It is a historical statement that was sadly needed. I can but admire the ingenuity with which dentists have utilized every new invention, and made it tributary to their own work. No sooner is a discovery of some new principle in electrical science, for instance, made known to the world, than straightway it will be found, in some modified form, in the offices of all the advanced dentists of the country. Of rubber, the number of ways in which dentists have utilized it is astonishing. The most of the implements and tools that they use have rubber in their composition in some manner.

Dr. F. E. **Howard**: I have listened to the paper with great interest, for it contains information not possessed by the average dentist. When we take into consideration the innumerable uses made of rubber in every department of mechanics, we wonder how the world got along before its discovery. From a consideration of the difficulties that manufacturers must encounter in securing pure gum, we are no longer left to wonder why the product is at times inferior. There are so many chances for a bad result that it is strange that we get as good as we do, and it implies extreme faithfulness on the part of some of the manufacturers.

I well remember the attempt to introduce the "milkweed" rubber. We were then in the midst of the contest with the Goodyear Dental Vulcanite Company, and we hoped that this might bring us relief, but it seems there was nothing in it.

Regarding the porosity of rubber, it would appear to be the reverse of the formation of gas, when we remember that if a plate be vulcanized at a high temperature, the ordinary rubber will not come out homogeneous. Yet if a thick piece of rubber be allowed sufficient time in the vulcanizing, it will be as perfect as a thin piece would be. The gases have had time to escape, and so, from this standpoint, the statements of the paper would appear to be quite correct.

Concerning the "rubber sore mouth," to which allusion has been made, I am of the opinion that it is largely due to lack of cleanliness. All the forms of oral bacteria will, of course, find a ready field for their proliferation, and the more imperfectly a piece is vulcanized the greater will be the annoyance.

Dr. F. W. Low: My first thought in connection with this paper was, in what way can it be used in this Society? My second thought showed me that it has much to do with us. Dr. Snow has, in some of his papers, told us that black rubber contains nothing but pure rubber and sulphur.

Dr. George B. Snow: There is bone-black in it, but that is calcined.

Dr. Low: Will it not decompose?

Dr. Snow: I think it is so prepared as to be completely fixed.

Dr. Southwick: I believe that more of lamp-black than of bone-black is used for coloring.

Dr. Low: The subject of the shrinking of rubber during the process of vulcanizing has interested me a great deal. I use the Howell packer, and that, you know, leaves a considerable spur sticking out at the heel of the plate. When we have reason to suspect shrinkage, Dr. Lewis has instructed me to mark off the measurements at the heel of a lower plate, with a pair of callipers, and afterwards, if it was found that shrinkage had taken place, the plate was warmed and spread to the original marks.

I once had a patient who would never allow me to use a piece of rubber dam that had a hole punched in it, for fear of inoculation from some previous patient. But once she got a sore upon her lips that resembled an arsenical ulcer, and probably through the use of the rubber dam. I should like an explanation of that occurrence.

Dr. Howard: The discussion has become a very broad one, and I should like to say something of this contraction of rubber during vulcanizing. We have all noticed that a mended plate will not fit as before. Dr. Requa, of Rochester, suggests that if one-third marble dust be mixed with the plaster used in making the casts, this contraction will not take place. I believe this to be a fact, though I have never taken any careful measurements. I should like to know if any one has made such.

Dr. Straight: I do not know but we are getting outside the limits prescribed by our rules, which forbid the consideration of a subject from a professional standpoint alone.

The Chairman: A liberal interpretation of that rule has always prevailed in the Club.

Dr. STRAIGHT: A plate when vulcanized will never keep its exact position. It will even spring after it has been finished and laid away. Variations of the temperature in the room will affect certain manufactures. Rubber is never twice alike under differing circumstances.

Dr. ESCHELMAN: Could not a stay be placed between the heels of a plate to prevent this springing?

Dr. SNOW: I make a distinction between contraction and shrinking. The one is molecular, the other in the mass. I do not think that the contraction could be prevented in this way, because, although the stay might prevent it as long as it was in place, it would show itself as soon as the brace was removed.

Dr. HOWARD: Why is the contraction such as to be exhibited only at the heels of a plate?

Dr. SNOW: Because the porcelain arch does not expand and contract like the rubber, and so resists it that it is exhibited only at the extremities.

Dr. HOWARD: Is not black rubber more liable to this springing?

Dr. SNOW: It is probable, because the more the rubber is loaded with coloring materials, the less the shrinkage.

Vulcanite, ebonite, or hard rubber, as it is called, is the result of the chemical combination of caoutchouc with sulphur. Iodine has been used as a substitute for sulphur, as has been mentioned by the essayist; but I do not know of the process being used in practice. The combination is usually effected by the combined influences of heat and pressure; and with the rubber compounds now sold for dentists' use, experiment seems to show the necessity of both heat and pressure to insure the proper combination of the caoutchouc and sulphur.

While experimenting in this direction a few years ago, I used a vulcanizer in which the vulcanizing chamber was surrounded by a steam chamber. Steam could be admitted to the vulcanizing chamber, or excluded, the temperature of the latter being maintained at about the same point, whether it was filled with steam or not. I took occasion to vulcanize some samples of both red and black rubber, securing them in heavy tin foil envelopes, hermetically sealed by soldering. One of each kind of sample, red and black, was vulcanized with the steam turned on, and others with the steam turned off, the blow-off valve being left open in the latter case, so that there should be no pressure upon them. The samples vulcanized under heat and pressure were well done, and the tin foil envelopes were as closely applied to them at the end of the process as at the beginning. No gas, or at all events only a trace, had therefore been formed during the vulcanizing process. The samples vulcanized by heat alone presented a very different appearance. The envelopes were distented with gas (sulphuretted hydrogen), and the rubber could scarcely be said to be vulcanized at all. The sample of red rubber was soft and spongy, and the black rubber was in shreds, being completely blown to pieces by the gas liberated within it.

A small block of black rubber, moulded in plaster in an ordinary dental flask and vulcanized under ninety pounds steam pressure, was well done. A similar piece, exposed to heat without pressure, was hardened by giving it about three times the time required for the other, and was apparently well done, but on cutting it open a spongy cavity was found in its interior.

As no gateways were cut to allow for the escape of the rubber, both of these pieces were subjected to pressure by their expansion by heat. This pressure continued until sufficient shrinkage had supervened to remove it. Vulcanizing being thus partially done under pressure, there was not so much gas formed, and not so much sponginess. As the outside of the piece was well done, with the sponginess limited to the interior, it would seem to show that rubber hardens from the outside to the center; but samples vulcanized for a very short time, and only partially, were of the same texture all the way through.

When thick pieces of rubber are vulcanized, they are sometimes found to be soft and spongy in the interior. Three causes lead to this condition: the thickness of the piece, the purity of the rubber, and the temperature. Thick pieces become spongy more often than thin ones. Thick pieces of black rubber cannot be vulcanized as easily as similar ones of red rubber, black rubber being usually rubber and sulphur, without coloring matter. The more earthy matter the compound contains, the thicker the piece of it which can be safely vulcanized.

In the matter of temperature, it should be remembered that about fifteen degrees of heat are lost in transmission through the mercury bath, and that unless the air is expelled, about twenty degrees of heat are lost in transmission through the atmosphere of mixed air and steam included above the water in the vulcanizer. The temperature of the vulcanizer is therefore quite often considerably higher than it is thought to be. If thick pieces are to be vulcanized, even 320 degrees is a high temperature, and especial care should be taken, at all events, not to exceed it.

A good way to avoid the risk of sponginess in vulcanizing thick pieces, is to pack their interiors with pieces of old plates, or other rubber already vulcanized. These should be scrupulously clean and freshly filed all over, so that the new rubber will become firmly attached to them.

Given a soft, plastic material, like rubber compound, which can be readily moulded upon a model of the mouth, it would seem at first thoughts that a perfect fit to the plate were insured, but experience teaches us to the contrary. Rubber shrinks in vulcanizing, the specific gravity of black rubber increasing under the operation from 1.1333 to 1.1974. Its specific gravity increases during the first part of the vulcanizing process, by far the greater part of the change taking place during the first half or two-thirds of the time required for perfect vulcanization. It is also affected by the temperature to which the rubber is exposed, samples vulcanized at a high temperature having greater specific gravity than those cured at a low one It is quite likely, however, that the increased pressure due to the high temperature is the important factor in the case.

The increase in specific gravity can only obtain by a corresponding decrease in the bulk of the mass. From this reason, the mould which was completely filled at the beginning, is incompletely filled at the end of the vulcanizing process. The platinum pins are often insecurely held, and vacuities are formed, usually under the teeth and out of sight. The defects do not usually cause the dentist annoyance, but the spaces under the teeth serve as receptacles for particles of food, which by their putrefaction very often render a rubber plate an unutterably filthy thing.

Rubber expands under the influence of heat more than any other solid body. I am unable to give the figures for crude, or unvulcanized rubber, but vulcanite expands .0000467 of its length at about eighty degrees. The rate is known to be less for lower temperatures, and is presumably greater for higher ones. The rate of expansion of iron being taken as 1, that of brass would be 1.67, and that of Vulcanite 6.65, according to these figures. The great difference between the temperatures at which a rubber plate is moulded and that at which it is worn, shows that its contraction in cooling is considerable. It is not, however, sufficient to interfere seriously with the fit, unless gum teeth are used. The teeth, by contact with each other, form a continuous arch of porcelain. The rubber covering the platinum pins forms another arch, the two being connected by the pins. Porcelain experiences but little change by variations of temperature, while, as we have seen, rubber is very sensitive to them. The contraction of the rubber in cooling narrows the arch, and usually throws up the palatal portion of the plate, causing it to bear on the palate and rock. Before the plate will fit properly, it will at least require the edge of its palatal portion to be warmed and forced downwards a trifle. This does not make the plate fit the mouth, but the latter has a certain degree of adaptability, and it will yield sufficiently to fit the plate. The plate is still too narrow for the mouth. If, for any reason, the plate should be revulcanized, it would undergo a second contraction, and the amount would be too great for the mouth to accommodate itself to it. Common experience bears out this assertion, for it is well known that plates which were worn with comfort often give a great deal of annoyance after they have been revulcanized.

The best way to overcome the effects of contraction is to make a small mark on either side of the plate directly behind the molars, and set a pair of dividers accurately to the distance between the marks. Then warm the plate sufficiently to soften it, pull its heels apart so as to widen it, and cool it. The dividers will show how much it has been widened. In making a new plate, the marks can, and should, be made upon the trial plate immediately before flasking. In repairing, make them before flasking the plate, and stretch it then and there nearly a sixteenth of an inch. (The usual amount of contraction for each vulcanizing is about one thirty-second of an inch.)

The warping of plates from contraction is no new thing. It was one of the difficulties encountered in making gold plates, when the teeth were soldered to the plate, the expansion of the gold plate in heating and its subsequent contraction operating in much the same way as the contraction of the rubber plate. It was then the practice to insert slips of thin paper between the teeth, when gum teeth were used, to set them apart, and thus allow for the contraction after soldering.

In closing my remarks, allow me to recommend the use of a lower temperature in vulcanizing than is usually employed. Rubber vulcanized at a high temperature has a greater specific gravity than when vulcanized at a lower one; therefore its shrinkage is greater, and the defects in the plate caused by shrinkage are intensified. Being moulded, and assuming its form at the higher temperature, its contraction by cooling is greater, and the fit of the piece to the mouth is impaired. I believe that a fair trial is all that will be required to convince any one of the advantages of vulcanizing at a low temperature.

Dr. SOUTHWICK: The paper this evening is devoted to caoutchouc, its compounds and early uses before the discovery of the method of producing vulcanite, or ebonite as it is sometimes called, which has been, in the main, brought to its present state of perfection by accident, by experimentation, and by those who have, later on, studied the matter more from a scientific standpoint. The most of those present are aware of the fact that I have for years advocated and demonstrated the necessity for using extremely low temperatures in vulcanizing, if you wish to retain anything of the original and essential features of the rubber. Its elasticity once destroyed by undue heat, its strength is lost forever. So far as its uses in the dental profession are concerned, unless the greatest care is used in this direction, your efforts to produce a perfect adaptation to the parts will be a complete failure, practically, and the reasons are these: At whatever temperature the vulcanization, or chemical change that is produced in the rubber takes place, the particles become fixed, and as it is very sensitive to thermal changes, you will readily see that the difference between 320° Fahr., the usual temperature to which it is raised, and that of the mouth, is considerable, and must destroy anything like an adaptation, if block teeth are used, because of the direction of the contraction. The lower the temperature, provided it is sufficient to produce the chemical change in the rubber, the less contraction is there to contend with. From my experiments in this direction, I am satisfied that the temperature should never be allowed to go above 300°, and 280° is far better, only taking longer time. I look upon 300° as the point at which destruction or deterioration commences.

What is vulcanization but a chemical change produced in the materials used (rubber and sulphur), so combined as to form a new compound, having none of the distinct features of the originals, and yet so carefully combined as not to destroy the essentials. Caoutchouc fuses at 248° and volatilizes at 600°. Sulphur fuses at 239° and will chemically combine, forming a new compound, as low as 250°, but the low temperatures require more time to produce the change. So you see that it is not necessary to use a high temperature to produce the best vulcanite.

Some of you are aware that I have, for some years, been interested in a company that is manufacturing rubber clothing. We have experimented very largely and made many costly mistakes. Our vulcanizer is a room probably twelve feet by fifteen, and is heated by steam pipes. The temperature we employ is about 250°, and we subject the articles to this heat for four hours; but of course we do not produce ebonite or hard rubber, though the process of vulcanizing is essentially the same.

Dr. BARRETT (closing the discussion): We must not forget the fact that it is only secondarily that heat has anything to do with vulcanization. The essential process is the chemical union of the sulphur with the rubber, and vulcanization is the effect at any temperature at which this will take place. At 320° Fahr., this occurs instantaneously; at 260° Fahr., it is a slower process, but there is no doubt that at the lower temperature the product is better.

I think it must be accepted as a scientific fact that sponginess or porousness is due to the generation of a gas within the mass of the rubber. This may be at a low temperature, provided the foreign material is one that decomposes at that point. The gum itself will volatalize at a high temperature, about 600°, when, of course, the entire substance is changed. It is burned up.

It is, no doubt, possible for the rubber gum, as prepared for the dentist, to absorb some kind of foreign substance in the dentist's office, and to give it off again at a vulcanizing temperature, and thus to become porous. Besides, the difficulties in the preparation of the gum tend to make a definite result very uncertain. I am glad that the subject has aroused so much of interest in the Club, and am inclined to the belief that comparatively few know in what the essential process of vulcanization consists, or can tell any except the physical difference between hard rubber or ebonite, and elastic rubber.

CORRESPONDENCE.

WAS DEATH INCLUDED IN THE SCHEME OF CREATION.

Editor DENTAL PRACTITIONER AND ADVERTISER:—The issue of *The Ohio Journal of Dental Science* for November, 1881, contained an article entitled "Does Nature Provide for Death?" The mere fact of the question being asked, and the necessity for comment, suggest in themselves that the writer is in doubt. He quotes Horace Mann as saying that Nature, in having the teeth grow as individual teeth, was providing for their separate extraction when decayed. This question now presents itself: Does Nature make the same provision for the entire animal kingdom? We find that from the lowest to the highest in the scale they all have individual teeth. Does Nature provide for the extraction of the teeth of a cat, or a dog? Nature certainly provides for death, because all the organs of the system of animals show that they were intended to subsist upon other animals, or organic things, consequently death must exist from a physiological standpoint to supply those organisms. One-half of the orders of life is designed to live upon the living tissues of the other half.

Again, the living tissue is constantly lapsing into death. The process of life necessitates this. Histology teaches us that the cells of any tissue produce others like themselves, the older ones being cast off. If, then, there is a constant reproduction of new cells, there must be death to the parent cells.

Nature just as certainly provides for death as for birth. "It is a struggle of life from the cradle to the grave." The writer's idea is that death was not an original design, for he says that "before man had violated any law we presume that waste and repair were equally balanced—in short that he was designed to live forever."

We learn from geology that death existed from the very foundation of life, ages before the possibility of the "transgression of laws."

Admitting the "Book" theory that "the Lord God breathed into his nostrils the breath of life, and man became a living soul," does not prove that the body does not die, nor that it was ever designed to live forever. The anatomist who cuts down and finds organs of the soul designed to live forever must have very keen powers of observation. What he really does find is death to all that is mortal, and that is all his mortal eye can see.

In conclusion, allow me to propound one question to the writer: If death was not an original design, a law that followed birth, how high a column upon the face of the earth would mortal man have formed from the beginning until the present day?

J. F. WAGNER.

TIFFIN, Ohio, March, 1892.

THE DENTAL PRACTITIONER
AND ADVERTISER.

DR. W. C. BARRETT, ... EDITOR.

BUFFALO, N. Y., APRIL, 1892.

AN EXAMINATION OF RECENT EXPERIMENTS MADE TO TEST THE RELATIVE CONDUCTIBILITY OF HEAT IN DIFFERENT MATERIALS USED FOR FILLING TEETH.

The relative conductivity of tooth fillings, especially those of a plastic character, is a subject that has frequently engaged the attention of dental societies in a desultory and unscientific manner, and without the possibility of arriving at any definite conclusion. It has been declared that certain materials that are sometimes used for temporary purposes because of a supposed lack of conductivity or susceptibility to thermal changes are, on the contrary, good conductors, and hence unfit for that kind of work. These assertions have been made upon mere opinion, based upon no series of recorded scientific experiments, and hence of no comparative value except as clinical observations, which may be varied by a thousand differing conditions.

At the Union meeting of the American and the Southern Dental Associations, held in Louisville, Ky., in 1888, a paper was presented by Dr. C. Edmund Kells, of New Orleans, which gave the record of a series of experiments conducted for the purpose of determining this question. The apparatus devised for testing the materials depended upon the expansion under heat of a zinc disk, which thus closed the current of a battery and rang a bell. The substance to be tested was placed upon the zinc disk. The results attained would be positive in the detection of the existence of conducting power, but they would necessarily be indecisive as to its amount. While nothing could be expressed in exact figures, yet the whole was intensely suggestive. Tooth enamel and the various filling materials in common use were tested. Enamel was found to be comparatively non-conducting, while with the metals and amalgams the response to thermal changes was almost instantaneous. Oxy-phosphate and oxy-chloride of zinc conveyed changes of temperature somewhat slower, while the response to gutta-percha was quite tardy.

The conclusions reached were: First, that the oxy-phosphates and oxy-chlorides are such good conductors of heat (the report says of heat *and cold*, which is an unscientific method of expression) that they should not be used alone for capping pulps exposed, or nearly so. Second, that such pulps should be protected by a layer of gutta-percha fully one-sixteenth of an inch in thickness where possible. Third, that no filling material equals the enamel in its kindly protection from thermal influences of the delicate tissues beneath.

These conclusions were generally accepted, and the plastics have since then been looked upon as good conductors of heat, and hence unfit for protective work. In dental society meetings they are commonly so spoken of at this time. Dr. T. L. Gilmer, of Chicago, not long since read a paper before the Odontological Society of that city, and which was published in *The Dental Review* for January, in which he detailed a series of experiments performed by him to determine the same matter, the results of which were more definite and decisive than were those of Dr. Kells. The apparatus used consisted in effect of fillings of the different materials in common use, in the form of small hollow cylinders, one inch in length, one-fourth of an inch in diameter, the bore of the cylinder being one-eighth of an inch, thus giving a thickness of material about the hollow core of one-sixteenth of an inch on all sides. These were made in an apparatus specially devised for the occasion, so that they should be uniform in size and shape.

The cylinders were so arranged as to form part of a conducting tube between an ice tank and a sink, a carefully graduated thermometer being placed in contact with the one under test. The whole apparatus, with the exception of the ice tank, was placed in a room carefully heated to a temperature of 96° F. The ice tank in an adjoining room contained water at a temperature of 34° F. When all the apparatus within the room had attained its temperature, the cold water from the tank was turned on and allowed to flow through the hollow cylinder until the thermometer had fallen four degrees, the time being carefully taken with a stop watch. This process was repeated with each of the separate cylinders. The index of conductivity was thus determined by the time it took in each case to cause the mercury in the thermometer to drop four degrees.

The results were as follows, the highest conducting power being represented by 1,000:

Gold (Rowan's cylinders),	1000.00
Amalgam (Lawrence's),	852.50
Copper amalgam (Ames'),	702.70
Oxy-phosphate of zinc (Justi's),	584.27
Oxy-chloride of zinc (Smith's),	525.25
Gutta-percha (common pink),	520.00

The figures are surprising and the results unexpected. It will be seen that they materially differ from those of Dr. Kells, but this does not necessarily reflect upon either observer, the methods employed being quite unlike. Those of Dr. Kells were very delicate and must invariably detect any existing conductivity, even though it be but small. But they were not adapted to the determination of its relative amount.

Those of Dr. Gilmer would not as quickly indicate a very slight ability to conduct heat, but they would be likely, if it existed in fully appreciable extent, to measure its comparative power with a fair degree of accuracy. There never was any question of the conductivity of any one of the materials tested. The only thing to be determined was its relative position in a scale to be established. For this end Dr. Kells' apparatus was not well adapted, while that of Dr. Gilmer was fairly so. Hence we must accept the more definite conclusions of Dr. Gilmer, until they are overthrown by some yet more scientifically conducted experiments.

It will be seen that, contrary to the opinion of many, oxy-phosphate of zinc is a better conductor than is oxy-chloride, although the difference between them in this respect is not enough to be of much practical moment in their employment, it being only about six per cent. But what is strangest of all, the relative conductivities of oxy-chloride and gutta-percha, our best non-conductor, are nearly identical, there being but a half of one per cent. difference. This does not seem in accordance with the usual results of practice, but it cannot be disputed because it does not agree with mere unsystematized, unscientific impressions, however general. The reputation of Dr. Gilmer for intelligence, knowledge, caution and candor are sufficient to establish his conclusions until they are disproved as erroneous.

In alloys, the relative conductivity must vary considerably, because the crystalline condition of any metal materially affects it, while the addition to an alloy of a metal of low conducting power does not necessarily reduce that of the compound.

The results obtained by the comparatively few reliable observers who have attempted to ascertain the relative conductivity of metals show considerable discrepancy. Silver, having the highest conducting power, is made the standard and placed at 1,000, the other metals being compared with it. The table presented by Dr. Gilmer is as follows:

Silver,	1000	Copper, cast,	811
Gold,	981	Tin,	422
Copper, rolled,	845	Platinum,	380

The difference between rolled and cast copper will be noted. Tin, notwithstanding its low conductivity, does not confer that quality upon an amalgam of which it forms a large part. Gold, when beaten into foil and then condensed into a filling, looses some of its great conducting power, through a change in the crystalline structure and a lack of homogeneity.

This table shows, however, a wide divergence from any of the others. We do not know from what source Dr. Gilmer obtained it, but there is evidently an error somewhere.

Fownes gives the following as the results of one set of experiments:

Silver,	1000	Steel,	116
Copper,	736	Lead,	85
Gold,	532	Platinum,	84
Brass,	236	German Silver,	63
Tin,	145	Bismuth,	18
Iron,	119		

Wiedemann and Franz give the following table, as ascertained by them through tests of rods about 5 mm. thick, one end being kept at a temperature of 100 C., the rest of it in a vacuum:

Silver,	1000	Steel,	103
Copper,	748	Iron,	101
Gold,	548	Platinum,	10
Brass,	250	Lead,	8
Tin,	154	German Silver,	7

Other observers have obtained yet different results, so that it is probable that the exact relative conductivity of the metals themselves has not yet been precisely determined.

The subject is a broad one, and it loudly demands further investigation. All dentists are under obligations to both Dr. Kells and Dr. Gilmer for what they have accomplished in this direction.

INTROSPECTIVE, AS WELL AS CIRCUMSPECTIVE.

"The fault, dear Brutus, is not in our stars,
But in ourselves, that we are underlings."

If the most earnest care and faithfulness are demanded at the hands of any man who serves the public, the dentist is that individual. A single moment's inattention jeopardizes an important, an expensive, and a painful operation. The most conscientious and minute nicety are essential to the performance of dental work, and no man has any right to assume the duties of a dentist who is not prepared to give to that work all there is in him.

Patients often visit good operators with their mouths full of all kinds of poorly inserted plastics, who have been told by their former dentist that their teeth would not bear gold fillings. They are too hard or too soft, too fragile or too tough for anything but plastics, when the plain fact is that the whole fault was with the dentist, who was too unskillful, or too careless and slovenly in his methods, to use gold properly. It is the King of Metals, and it will not submit to poor service. Even the amalgam fillings found in the mouths of such patients are a sure index to the cause of the failure of gold. But sometimes those who strive to do faithful service are made to feel as the peacock is said to do when he looks at his black, awkward feet. Such an experience was ours not long since. A large filling had been inserted in the mesial surface of a second superior bicuspid, the cavity extending well up under the gum and involving nearly the whole proximal face of the tooth. The gold was nicely finished when the operation was completed, and we felt a large degree of self-complacency when we looked at it. The filling was evidently one of our best efforts.

At the next sitting, the first bicuspid adjoining it was taken in hand, and was finally found so badly decayed and so friable that it was decided to put a crown upon it. When what remained of the enamel wall was ground away and the crown made and ready for setting, the idea suddenly presented itself that this was an excellent opportunity to make a critical examination of a filling that had just been inserted under the same circumstances in which a thousand such teeth had been filled. It appeared beautiful, and our confidence in it was perfect. The rubber dam was put in position, the hot air blast used to evaporate any concealing moisture, and we started in with a fine explorer. We had not gone half way around the filling, had in fact just reached that critical point, the cervico-lingual angle, when we became aware of a suspicious yielding. A little force, and the delicate point slumped into that piece of work in which we had felt so much pride, and our heart dropped quite down into the hypogastric region. There was a bit of softened dentine which had not been removed in the excavating, an imperfection which only a fine exploring instrument firmly pressed upon the point at right angles would reveal, but quite sufficient to have induced recurrent decay.

Great Heaven! we thought; if this is the state of what we imagined one of our best efforts, what might not be the condition of an hundred others inserted under less favoring circumstances? Only a mere accident has revealed this; what kind of a tale might not the same casualty tell of other like, or perhaps less excusable, blunders? Can it be that the fatal recurrent decay that we have seen, and which we had endeavored to escape the responsibility of by attributing to—well, incompatibility of material, or imperfect tooth structure, bad hygienic conditions, or anything to shirk severe self accountability—can it be that that failure was due to our own incompetence, or our criminal carelessness? It was not a pleasant self-inquisition to face, and yet common honesty demanded that the issue should be squarely met.

We have pondered the matter deeply since that time. It was not the first instance in which we had caught ourself in a compromising professional situation, and we determined now that we would have the thing out with ourself. We have examined other specimens of our handiwork, and not always with satisfactory results. We have made a resolution of better things in the future, for we will not soon forget the self-humiliation of that hour of acknowledged failure.

If we can not escape the conclusion that we have at times been careless, the only consolation left is to cast about and see if we have not companions in culpability. Calm reflection leads to the belief that we are not so much worse than other people. We have occasionally seen recurrent decay in fillings that other men have inserted. If we can not lay the flattering unction to our soul that our own failures were due to influences beyond our control, is it certain that this is not the case with others? If our failure was due to our own lack of thoroughness, is it certain that when the same thing occurs in the practice of another it can be ascribed to adverse electrical conditions? If the gold in our filling was not perfectly consolidated, may it not be the truth that the incompatibility in the filling made by another is rather that of the operator than of the material?

Mind, we do not mean to assert that there is no such thing as adverse electrical influences, or badly chosen material, but will that account for every failure? When gold fails, is it certain that an amalgam filling inserted by the same hand and in the same way would have succeeded? Even in children's teeth, may it not be that sometimes gold fails because of the difficulties in the way of making a good operation, rather than in anything inherent to the nature of the metal itself? Let us be honest with ourselves. Does amalgam always, under all circumstances, preserve teeth that gold will not? In fact, may not some of our failures be due to ourselves, rather than to the weather, or the gold-beater, or the patient, and are not some of our diatribes against that monarch of metals a kind of special pleading on our part, and an attempt to shirk the responsibility that really belongs to us by raising a false issue? The unskillful mechanic, you know, always has a dull tool.

My Brother, will it not be well to look into this matter a little more closely? Some way, men like Varney and Webb never found that gold was such an unreliable material. They were not troubled with incompatibility, nor did they encounter destructive galvanic currents in the mouth. How is it that *we* meet with such adverse conditions? Again we say that we do not desire to argue that there are no such things, but, My Dear Brother, may it not be that sometimes the wolf that we encounter is but a phantom of the true wolf, and that it exists only in our imagination? What has happened to one may happen to another. The errors that another makes we may also be guilty of, if the truth were known. The scholarly reader will call to mind the declaration of Thoreau:

"I never dreamed of any enormity greater than I have committed. I never knew, and never shall know, a worse man than myself."

OUR TERMINOLOGY.

The term "Morsal" is offered as an addition to our dental nomenclature, to designate the occluding surfaces of molars and premolars and the cutting edges of incisors and cuspids. We hope it will not be adopted. It sounds outlandish. It is derived from an obscure Latin root, most of the derivations of which have become obsolete, and besides, we can not see any necessity for its addition to our already complicated vocabulary of technical terms. It is not in harmony with any kind of system that could possibly be adopted, and hence if the day ever comes when any comprehensive and methodical scheme of nomenclature shall be devised it will stand in the way.

One of the great defects in our professional and technical terminology is the entire lack of harmony which pervades it. The terms have been added by chance, and at the whim of some one with force and authority enough to introduce them into general use, without any reference to existing technicalities. Thus our nomenclature has become a kind of conglomerate, made up from Latin, Greek, German, French and other languages, tinged by English idioms, too often wrenched from their obvious original signification like a tooth of untimely extraction, and violently implanted into territory with which they have no kind of natural affiliation.

We have the extraordinary spectacle of Latin roots with Greek prefixes or suffixes, and English words with terminations that are a parody upon proper orthography. This has mainly come from the introduction of foreign words by those who were not scholars in that language. With what propriety can one who is not a real proficient in the Greek tongue attempt the patching up of English by Greek roots, dug out as with a crowbar? As well might one take his ebony cabinet to a blacksmith to have an additional section of iron spiked on.

There should be the same harmony existing in the terms used by us that there is in botany or geology; some kind of a system to which our terminology should conform. Until we reach such a desirable consummation, the fewer unassimilable words that are introduced the better. Let us tend toward simplicity rather than complexity. Dentists as a body are not yet sufficiently erudite to handle the Greek with any degree of dexterity or grace. Good English comes hard enough to the most of us.

From all which the reader may naturally infer that we do not take kindly to this new-fangled monstrosity in language. Well, the reader is very quick of apprehension and skillful in drawing an inference.

PRETENTIOUS IGNORANCE.

Not infrequently do we receive circulars and advertisements that contain the grossest outrages upon the English language. Dentists are supposed to be men of some education. The fact that they are required to possess a little book knowledge, and that they must be reading men if they are competent for their duties, seems to presuppose a degree of culture on their part. And yet we know that this is not always found, and that some of them are the veriest boors, so far as mental discipline and scholastic training goes. Surely, these men can not be unaware of their own deficiencies. And yet, this is the class that, if we may believe their own testimony, invariably discovers the great secrets of nature. Some new anæsthetic mixture, warranted to be entirely safe and harmless and more effectual than chloroform or ether, is every little while presented to the profession in language that makes an educated man shiver. Invariably it is composed of different elements, some of which have no possible relation to anæsthesia, while the chances are that others are incompatibles. New principles in science are not revealed to men whose language shows that they are utterly unschooled.

The most of the circulars constantly flying about announcing new methods of great importance to dentists, great inventions by which the merest tyro can accomplish effects unknown to the oldest and most experienced operators, are written in language that would disgrace a school boy of a dozen years. Here is one before us now, which declares that "any dentist, even though he never saw a blow-pipe, can make gold-plates, crowns, bridges" with this incomparable material better than can the most experienced dentist in the old way.

Here is another circular that announces a wonderful discovery, by which the necessity for treatment and filling of the roots of dead teeth, or "attempting to fill tooth canals," is entirely obviated. The advertiser has employed it in his own practice, "the largest in this city for three years without meeting with one failure."

Let us apply a little logic to this assumption. The language employed demonstrates that he is not a supernatural being, because it contains errors, and "to err is human." If he could prove himself to be something more than mere man, he might claim that he always succeeds; but being shown by his own circular to be subject to the same weaknesses that afflict the rest of mankind, it is not possible that he should be entirely exempt from mistakes and consequent failures. Hence his assertion is a falsehood. If his practice is "the largest in this city for three years," or even for one year, our estimate of the intelligence of the people of Pittsburgh has dropped nearly down to zero.

The remedy is applicable to "ulcerated" teeth. It does not "escar or burn the cheek or tongue," and it is "a great handle to business." Is such an advertiser as this, one who does not seem to be aware of the difference between an abscess and an ulcer, who uses the noun eschar as a verb, misspelling it at that, is this the kind of man who will be likely to comprehend and control the worst pathological conditions, to cure diseases that have sometimes baffled the efforts of the most skillful and well informed, and that, too, by methods that are but a parody upon all science? If such is the case there is certainly no use in study, for the ignorant knows more than the learned, and the uneducated is better fitted to deal with things of which he knows nothing than he who has spent a lifetime in their study.

It is all very well to sneer about men of theory and to make a mock of scientific study, but this world is not governed by mere chance. Not an effort of any kind can be put forth by mortal man, from the mere winking of the eye to the construction of a great marine engine, that is not done under the dominion of rigid scientific law. As Dr. Patterson so pithily expresses it, in words that should be emblazoned on the walls of every dental office in the land and over the doors of every dental and medical school in existence, "True practice must always be the result of true science."

Here is an extract from a letter received from one of these great benefactors of the human race, who has made some of the most wonderful discoveries of the century, and who stands ready—for a consideration—to impart to others his astonishing knowledge:

"I drop you these few lines to ask you if you will let me no of the farest way to let the People no why rubber plates are so ingurous customers are coming here and finding fault until I wont use them enymore."

Of course he has an invention of the greatest scientific value, the result of many years of exhaustive study and intense application, which entirely obviates the difficulty, and which he will be glad to furnish at a comparatively small sum.

All dentists of any repute are constantly receiving these evidences of ignorance and lack of professional feeling. To any intelligent man they must carry upon their face the incontestable proof of the utter incompetence of the advertiser to deal with the very simplest question in mechanical or medical science, much less to solve problems which have puzzled the wisest men in dentistry. Scientific laws are not among those which are "hidden from the wise and prudent and revealed to babes and sucklings," however it may be in theology.

Perhaps the greatest wrong is done by certain ignorant small manufacturers, who publish certificates from dentists. A circular from such an one lately received includes forty-nine commendatory extracts, averaging about ten words each. Fourteen of this number contain gross grammatical errors, and some of the others escape only by a very liberal interpretation of their meaning. The names appended are mostly unknown to fame, and the residences are usually country villages. The article commended is one that would find its principal sale among the cheap dentists.

But is it a fact that twenty-five per cent. of these certifiers are as illiterate as their testimonials would indicate? Of course the manufacturer who publishes them is an ignoramus, and there is a bare possibility that he may have garbled some of them. Let us hope so, for it is not pleasant to contemplate the kind of professional man who is capable of saying publicly, "The work you done for me was very satisfactory," or "The material received from you works splendid," or "I find what is received from you of good quality and remains perfect." Such exhibition of illiteracy will not impress the public with a very high idea of the culture of dentists.

But what shall be said of a dealer who will send out these derisive circulars, that are a source of humiliation to every educated dentist? The worst of the whole matter is that they undoubtedly attract customers; and what must be the status of a great proportion of dentistry, when it is attracted by these pitiful exhibitions? It is quite possible that the small manufacturer may have technically educated fingers, but why, if he expects us to employ them, will he not in turn employ an educated head to compose, or at least to correct his circulars? If he does not he should be reminded of the display he is making, and informed that dentists usually are not sciolists who are readily caught by ignorant pretenders.

GLASS INLAYS.

The low-fusing, pulverized glass body that has been extensively sold during the past year for making inlays for cavities in teeth, does not seem to be an unqualified success. It is very difficult to adapt the color, and secure that which will harmonize with the tooth, and the material, when prepared, has an opaque appearance, unlike that of the porcelain bodies. But the principal trouble lies in the fact that these glass inlays have little strength, and fracture when submitted to any real use. The successful low-fusing body has not yet been discovered.

UNSCIENTIFIC OBSERVATION.

There are a great many people who are engaged in making observations upon scientific matters, but there are very few who are really competent to the task. We have the most widely conflicting testimony from men engaged in the same work, because each is swayed by some preconceived theory, and sees just what he wishes to see and nothing else. There are very few who have such a really judicial mind that they can divest themselves of all prejudice and weigh every factor justly. What is known, for instance, of the condition of the saliva under varying circumstances, and in pathological conditions? And yet the journals and books are full of the accounts of conflicting observations, made by men who are either incompetent to conduct a scientific experiment, or incapacitated for recording results because their minds are not free from bias.

One man records two hundred observations of the saliva in the mouths of animals, without any classification whatever, mingling the reports of the carnivora, the graminivora, and the omnivora together, when it ought to be well known that the saliva of different orders varies widely. He evidently takes the mixed fluids of the mouth and samples the whole, unmindful of the fact that in many orders of animals the parotid saliva has special characteristics that distinguish it from that of the other glands, and that these characteristics are intensified or modified by the mental state of the animal, and by conditions of repletion or hunger.

He tests the saliva of three hundred human beings, without attempting to separate that of the different glands, or to determine whether there is or is not present degenerated mucus from diseased follicles, and regardless of the condition of the digestive organs and whether food has been recently taken or not. He simply sticks a piece of litmus paper into the oral cavity and looks to see if the color be changed, thoughtless as to what may have induced it, whether an acid condition of the real saliva, fermenting food, or the products of diseased action.

What is to be learned from such slovenly conducted observations as these? The results are almost certain to be misleading, and to work harm to professional progress instead of good. There are many questions in our practice that can never be settled until long series of experiments have been conducted, and continued observations are seriously demanded in many fields. But unless they are in accordance with scientific law they are worse than useless, and unless they are recorded in a spirit of true, self-abnegated honesty, they will be misleading. Let us have the results of observation, but let all the circumstances and methods be revealed, that men of knowledge may know whether to place reliance upon them or not.

THE DENTITION OF ANIMALS.

"It has been a question with me whether it is an established fact that cats lose their cuspids in infancy, writes a correspondent of *Popular Science News*. In regard to the second dentition, I have asked friends if they had noticed the loss of the first teeth, and they had only missed the cuspids. Is this mentioned in natural histories? I am curious to know; also, whether dogs have a second dentition."—*A Correspondent, in Items of Interest.*

The above is not a very creditable exhibition of dental intelligence. We love to speak about our scientific standing and scientific progress, yet here is a dentist, a graduate of a dental college, a practitioner of some standing, publishing to the world in the pages of a dental journal that is widely read, that he is in the deepest ignorance of the dentition of a common domestic animal; that he has not the slightest knowledge of the most rudimentary fact in dental science. We think that our friend Welch should not have permitted such ignorance to be aired, but for the credit of the profession should have exercised a little editorial authority and squelched the communication.

All of the mammalia (animals which nurse their young) are divided into monophyodonts, those which have but one set of teeth, and diphyodonts, those which are provided with a deciduous as well as a permanent dentition. It is usually the lower orders which are monophyodonts, and they mainly comprise the edentata—sloths, armadillos, ant-eaters, etc.; the cetacea—whales, dolphins, etc., with the dugong, and a few other families. All of the higher mammalia have two sets of teeth, and the deciduous or temporary ones are shed precisely as are those of human beings, but of course at ages which vary with the species.

The next grand division of vertebrate animals, according to dentition, is into homodonts, those whose teeth are all alike in form, such as the reptiles, including snakes, crocodiles and alligators; and heterodonts, those which have teeth of different forms, incisors, cuspids, premolars and molars. Most of the monophyodonts have a homodont dentition, while diphyodonts are usually heterodonts.

As in human beings, the deciduous dentition of all animals is commonly made up of incisors, cuspids and molars. In the permanent dentition the diciduous molars are succeeded by premolars (called in man bicuspids) while the true molars, which did not exist in the deciduous set, come from germs that had no predecessors. A bicuspid, or premolar, then, is a tooth that belongs only to the permanent dentition, and that succeeds the deciduous molar. Man, from the standpoint of the comparative anatomist, is only an animal, and his organs do not differ from those of other animals any more than those differ from each other, except as they may be differentiated. He has not an organ or a tissue that some other class of animals does not possess, and in their development he follows the great law of nature which dominates all orders. The correspondent referred to does not anatomically or physiologically differ from his dog, except in being more highly developed. Now let him look and see if he can discover how many true permanent molars a dog has.

JUST A HINT.

It is a compliment when the editor of another journal finds something in *The Practitioner* that he considers worth transcribing to his own pages. It indicates the approval of an experienced judge in such matters, and we feel accordingly gratified. But we like to have others know of the compliment thus paid us, and to receive the mental approbation of the one who peruses it. It is fairly our due, but how can it be obtained if the customary journalistic credit be not given?

Some of the matter in the last number of this journal has been quite extensively reprinted, and in most cases full acknowledgment made. But in at least two instances, articles expressly prepared for these pages were appropriated and published as if originally prepared, and that by those from whom we had the right to expect better things. It is to be hoped that it was but an inadvertence. Whatever we have is heartily at the service of our brethren, but we sincerely hope they will not deprive us of the personal gratification that the compliment might bring.

THE SAME, AND NOT THE SAME.

The *Dental Cosmos* has assumed a new appearance, and we must have our growl at it before we accept it as a settled fact. Ranged in a row on the shelves in our library are twenty-three bound volumes of the *Cosmos*, and by their side twelve volumes of its predecessor, *The Dental News Letter*. Every one of those thirty-five volumes presents a clean, neat, readable appearance, more especially the pages of the *Cosmos*. But the press of matter demanded more space, and so the clear, beautiful pages of the last volume have been succeeded by a crowded, dull, unreadable, vexatious kind of a blur to all but the strongest vision. We have read the good old *Cosmos* so long that we can not be reconciled to the new appearance.

If more space were demanded, surely the publishers are abundantly able to increase the number of pages, large as the journal now is. The eyes of dentists are so sorely tried by their work that their reading should give them rest. And some of us—God help us—are not as young as we once were, and want to spare our eyes. Many of us have taken the *Cosmos* so long that we feel a kind of proprietorship in it. We have invested a good many dollars in it. To be sure, we have always received good dividends on the expenditure, but we want the same old *Cosmos* that we have had so long, improved in quality, of course, as it always has been from year to year, but the same in its general appearance.

Why, if we tamely submit to this change, the next thing we know the cover will be a sky-blue, and that time-honored quaternary in the motto will be discarded for a quotation from Mark Twain. Well, we have entered our protest and had our grumble, and are now ready to accept what we can not avoid, but we won't acknowledge that we like these pudding-pages.

MOUTH NAPKINS.

We see it stated in the reports of discussions of dental subjects, that it is important that mouth napkins should be carefully washed. We take issue with the statement. They should never be washed at all. They are not worth it. The dentist who clings to the old-fashioned linen mouth napkin is away behind the times. Sterilized canton flannel may be bought for a few cents, and a single yard of it is sufficient to last an ordinary office for weeks, at least. It can be cut into napkins of varying sizes, and once used they should be thrown into the waste basket. This material is much better than linen, for it is soft and agreeable to the mouth, while it is a better absorbent of saliva.

Some years ago we purchased from Seabury & Johnson, one hundred sterilized canton flannel napkins about fifteen inches square, at a cost of two dollars. These were cut into four, six, eight and sixteen pieces, and they lasted for considerably more than a year. Since then we have bought the sterilized cloth and cut it to suit the occasion, and the expense is less than that of the mere washing of linen, while we are always certain that we have one that is pure. No, No; don't wash mouth napkins.

ANOTHER DOGMA.—We have lately been revising our scientific litany, and have concluded to add the following in its proper place:

From all intolerance and bigotry of opinion which forbids the reception of new ideas; from all inordinate credulity in the acceptance of new ideas; from all extravagance and preposterousness in the statement of new ideas; from all complete surrender to the domination of new ideas; from all one-idea cranks of any kind, GOOD LORD DELIVER US.

BIBLIOGRAPHICAL.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY for 1891. By B. H. Catching, D. D. S., Editor and Publisher, Atlanta, Ga.

We must say that we are happily disappointed in this volume. We had not thought it possible to make so judicious a selection of matter for re-publication, and to comprise within such comparatively restricted limits so succinct an epitome of the periodical dental literature of the year. Dr. Catching has skimmed the journals and presented only the cream. In fact, some of this cream he has churned by agitation with his own brain, discarding the watery portions and presenting but the rich, golden butter. We most heartily commend the volume, and hope that Dr. Catching may receive sufficient encouragement to continue the series.

A CHART OF TYPICAL FORMS OF CONSTITUTIONAL IRREGULARITIES OF THE TEETH. By Eugene S. Talbot, M. D., D. D. S. Wilmington Dental Manufacturing Co., Publishers, Philadelphia.

This beautiful work consists of sixteen colored lithographic plates, illustrating aberrations in development of the teeth and each the type of some special class, as of excessive or arrested development in the jaws, V-shaped and saddle-shaped arches, etc., etc.

Dr. Talbot's reputation as an authority on dental deformities is well established and needs commendation at no man's hands. The book presents no text for perusal, but illustrates to the eye by speaking plates. They are beautifully executed, and present the subject matter in a manner that would be impossible for mere words. We are inclined to think that the drawing in some of them may be open to criticism, but perhaps any crudities of that kind may serve to throw into yet stronger relief the specialization in the different types. As a whole, the work will form an invaluable aid to the comprehension of the subject of irregularities of the teeth. It may be procured of the publishers, 1413 Filbert street, Philadelphia. Price $2.50.

DENTAL QUESTIONS AND ANSWERS. We are in receipt of a book having the above for its title, from Gustavus North, A. M., D. D. S.

These quiz books are becoming rather common, and unless a new one has some special features to attract attention, it is apt to meet with an indifferent reception. The work of Dr. North, we are able to say, does possess some distinguishing characteristics. Unique in its physiology, novel in its anatomy, decidedly peculiar in its pathology, and refreshingly bizarre in its grammar, it certainly stands out from the other works of its class with an individuality all its own.

CURRENT NEWS AND EXCERPTS.

ANOTHER DENTAL COLLEGE.

The idea of organizing a Dental College in Buffalo is not a new one. Nearly forty years ago the late Dr. George E. Hayes, when reconstructing the building belonging to him on the corner of Main and South Division streets, arranged a hall designed especially for the lecture room of a Dental College, and the University of Buffalo, with a view of bringing about such a desirable end, elected Dr. Hayes a member of its council. No decided steps were taken, however, for a number of years thereafter.

At a meeting of the Eighth District Dental Society, held in Buffalo, June 2, 1868, nearly twenty-four years ago, it was unanimously resolved:

That it is desirable that a Dental Collegiate Department of the University of Buffalo be established, and that we pledge it the support of this Society.

In accordance with that resolution a committee of six dentists was appointed, consisting of Drs. B. T. Whitney, Geo. E. Hayes, C. W. Harvey, R. G. Snow, W. C. Barrett, and J. C. Gifford. That committee held a meeting on the 4th day of June, and adopted the following:

Resolved, That the Committee report favorably the plan of renting, for a term of years, the suite offered for the purpose by Dr. Hayes, provided a sufficient sum of money can be raised to fit them up and furnish them in a suitable manner, and to establish the college on a firm basis.

A subscription paper was circulated, but not enough of money was secured to warrant the opening of the school, and again the scheme slumbered for years.

After the opening of the Medical Department of Niagara University in Buffalo, two or three plans were proposed, and a school was even announced in connection with that University, but it was finally adjudged impracticable.

When the University of Buffalo formulated plans for a new university building, the architect was instructed to include with the medical, the law, and pharmacal departments, suitable rooms for a dental college, and the dentists of Buffalo were invited to organize such a school. They were at the same time informed that if they did not choose to accept the task, the University would be compelled to call for assistance from abroad.

The work was undertaken by a committee appointed at a meeting of the dentists of the city, after a full discussion of the whole question, and that committee, consisting of five of the oldest and most experienced members of the dental profession of Buffalo, has reported favorably. A Dental Department is now in process of organization, and teaching will be commenced with the fall term of 1892. The faculty will be made up of a regular lecturing staff of dental teachers, a clinical dental staff, and a staff of university teachers, who will deliver special lectures for the benefit of dental students.

The university building, now in course of construction at the corner of Main and High streets will, with one exception, be the largest devoted to medical teaching in America. Situated upon the highest ground within the city limits, with its western wing especially constructed for a dental school, with its fine museum, its great library, and its three complete amphitheatres, it will afford to dental students house accommodations such as few colleges can offer. The Buffalo General Hospital is upon the same street, but a short distance away, and this will be open to the dental as to the medical students. The Sisters of Charity, the Fitch, the Emergency, and other hospitals also offer unusual advantages. The college will be situated in a neighborhood that will afford abundance of clinical material for the infirmary, and altogether the prospects seem flattering. The school will take advanced ground in demanding a full graded course of three years, and will come up to all the requirements of the Dental College Faculties Association.

It proposes thoroughly to equip its students for practice, and that there may be sufficient evidence of this, their graduation will be practically placed in the hands of a body that will be entirely independent of the Faculty. Every student will be required to appear before a Board of Curators, consisting of representative men from different localities, and including every member of the Examining Board of The Dental Society of the State of New York. Before this Board of Curators every student shall be examined, and he must receive their approval before he can be graduated. Every department of the College will be open at all times to the inspection and examination of the individual members of the Board of Curators, and they will be expected to make themselves familiar with the work done in the College. The Faculty will thus be relieved from the responsibility of a final decision as to the qualifications of the student, and will not be liable to the charge of a desire to graduate matriculants for the fees that they have received.

THE CONTRACTION OF RUBBER PLATES.

[The following paragraph was crowded out of its proper place in connection with Dr. Snow's remarks before the Stomatological Club.—EDITOR.]

The fact is well established that vulcanite contracts in cooling, and, in consequence, dental plates made up with section teeth almost invariably warp, and require more or less manipulation before a satisfactory fit is secured. In the case of upper plates, the change is quite apparent, the rear palatal portion being thrown up, causing the plate to rock. The arching up of this part of the plate is caused by the contraction of that portion immediately behind the teeth, the thin palatal part acting as a stay, and diminishing to some extent the amount of change experienced.

When, in repairing an upper plate, the center portion is sawed out, it will be found that its heels will spring together,—certainly as much as the amount removed by the saw cut, and sometimes even more. This shows that the same action takes place with lower plates, and to a greater extent than with upper ones. As they leave the vulcanizer, full lower plates, with section teeth, are always sprung together at the heels, and are too narrow for the mouth. If they are re-vulcanized, they are thereby made still narrower, and are, thereafter, in many cases, not capable of being worn with comfort. If they are heated sufficiently to soften the rubber and are then widened, the beneficial effect upon the fit will be quite apparent.

HOW GOOD OF THEM.

It is overpowering to consider the extreme solicitude that some manufacturers of dental goods exhibit for the convenience of dentists. It is well known that if sheets of dental rubber are placed in direct contact, they are apt to stick together. Some of the makers, therefore, insert sheets of paper between them to prevent this. Others interlay thin muslin; but one manufacturer takes such extreme care to prevent any annoyance from this source that he inserts *two* layers of muslin, loaded with starch to near the thickness of the rubber sheets. This man ought to be remembered by dentists, and probably he will be. Such thoughtfulness should receive its due reward.

Of course the fact that starch is worth three cents a pound and rubber three dollars, has nothing to do with the case. Dentists would as soon pay three dollars for starch as for rubber, and when they purchase a box they are not at all particular as to which it contains.

THE INTERNATIONAL MEDICAL CONGRESS OF 1893, IN ROME.

Some of our readers will remember that at the meeting of the Central Association of German Districts, held at Breslau, a committee of seven was appointed to look after the interests of the Dental Department at the International Congress at Rome. This committee, of which I am a member, has up to date done nothing, which may be excusable in view of the length of time yet at their disposal, but which can hardly be called practical, because, as we learn from various sources, the nomination of some of the committees on organization for different sections has already taken place, and the dental section has not been named.

As we are not in communication with the leading members, we are rather inclined to look upon this as a simple ommission, for when we consider the loose relations which exist between doctors and dentists, we cannot be surprised to find our interests a secondary consideration.

As the organization of the Congress rests in the hands of physicians, we must not feel too sore when the table is not spread for us at the outset, for everybody looks after his own interest first.

But now the above named committee has concluded to ask for the formation of a dental section at the Congress. Correspondence on the subject is well under way, and we do not doubt that the result will be satisfactory to all, for, even ignoring our own interest, Italy must feel most concerned in the dental section, because several Italian Universities intend to open dental Institutes. To further such a plan, an opportunity to assemble in Italy a large number of prominent dentists from different countries and learn something about the present status of dental science will be of the greatest advantage to the country.

PROF. DR. HESSE,

In Deutsche Monatsschrift für Zahnheilkunde.

DOCTOR W. D. MILLER.

It will be a source of regret to many to know that the health of Dr. Miller is in a very unsatisfactory state. He has been suffering from nervous prostration, and was, about the first of February, ordered to a warmer climate by his physicians. Since that time he has been in Monte Carlo, where he has been slowly regaining strength. The interruption to his business, and what he regrets yet more, to his studies and observations, has been very serious. For years he has been conducting many series of experiments, sometimes extending over a long period of time, for he is not in the habit of accepting as final any results that have not been exhaustively tested. These are all interrupted, and the labor expended on some of them entirely lost. This means not alone a misfortune to Dr. Miller, but it is calamity to the whole of dentistry, for he had hoped that he was near the point of the solution of some problems that have long vexed thoughtful men.

This illness makes extremely problematical the projected visit to America next summer, to which those of his friends who were aware of his intention had looked forward with great interest, for he had contemplated a course of illustrated lectures here which would have delighted the heart of every practitioner.

The announcement that Prof. Miller had accepted any permanent position in America was a mistake, and should never have been made.

PROFIT OR PRAISE?

In reading the discussions of papers in some of our dental societies, one is too often impressed with the conviction that the whole is but a farce. This is largely the fault of the writers themselves. They will ask for a thorough discussion, when that is the very last thing they want. They express a wish that the essay may have consideration, when they really mean compliment. They invite controversy, but will accept only commendation. They pretend they want truth, when taffy is what they are after. There is no real discussion unless the other side is brought out, and if this is done some authors make it a matter of personal offense. There is nothing to be learned from an echo. You get no benefit from the man who stands behind you. It is he who confronts you, who stands foot to foot and eye to eye with you, from whom you gather inspiration. Until you meet with an adversary there is no opportunity to try your mettle, and to find out whether your sword is made of lead or keen steel. One never discovers the really weak spots in his armor until he has been in action. So you can not tell whether your finest spun theory will stand the test until it has been submitted to the fire of real criticism, and that is what the sincere student and seeker of facts should desire above all things.

THE PROPORTION OF PROFESSIONAL MEN IN VARIOUS COUNTRIES.

The misproportion of medical men in the United States, when compared with other countries, is simply ludicrous. France, with a population of 38,000,000, has less than 12,000 doctors, and graduates 624 medical students a year. Germany, whose population is about 45,000,000, has about 30,000 doctors, and graduates 935 students per annum. The United States, with a population of 63,000,000, has about 100,000 doctors, 13,000 medical students, and graduates 3,740 medicos per year.—*Dental Review.*

That is hardly a fair statement of the case. In France, as in Germany, there are a number of grades of physicians, the great body of them practicing without the highest qualification, which alone is recognized as admitting to full practice in surgery, midwifery, and all the branches of medicine. In France the "Officers of Health" (*officier de santé*) outnumber the full practitioners. In Germany there are some cities of 50,000 or more inhabitants that are recorded as being without a dentist. That simply means that no *Hof-zahnarzt* happens to be located there, while there may be a swarm of the lesser grades, like *Zahnkuenstlers*, *Zahntechnickers*, etc., busily plying their vocation. Here we have no such division, but all practitioners are classed alike. So the above statement is a little misleading.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Preliminary Notice.—The Dental Society of the State of New York will hold its Twenty-fourth Annual Meeting at Albany, Wednesday and Thursday, May 11, 12, 1892.

Papers will be read by the following distinguished members of our profession: Edwin T. Darby, D.D.S., Philadelphia, Pa.; Eugene S. Talbot, D.D.S., Chicago, Ill.; C. F. W. Bodecker, D.D.S., New York City, N. Y.; Albert Carter Westlake, D.D.S., Elizabeth, N. J., and discussed by prominent dentists from all parts of the United States.

In order that the discussions may be interesting, all those who have been invited to open discussions will be allowed fifteen minutes, others ten.

Nothing will be left undone to promote the interests of practical and scientific dentistry.

No clinics. No exhibits. Please set aside the above time and do your share to advance the status of dentistry in the Empire State. Yours faithfully,

CHARLES S. BUTLER,
Secretary.

W. W. WALKER,
President.

"A THING OF BEAUTY IS A JOY FOREVER."

An instrument upon the operating table that is neat and ornamental, as well as useful, is gratifying in a double way. We have received just such an one, and it pleases our æsthetic and artistic as well as our professional sense. It is a delicate probe, which may be used for introducing dressings into root canals. The point is of spring-tempered gold, so that it will not be affected by acids, iodine, etc., and it is sufficiently delicate to enter almost any root canal.

The handle is of snake-wood, and there is a hexagonal ferrule or shield of sufficient size to keep the probe with its dressing raised from the table when it is laid down, and to prevent its rolling about. It is beautifully finished, and altogether superior to anything of the kind that has previously appeared. We have been forbidden to indicate from what source it came, lest it might be thought that the reading pages were used for advertising purposes, and so we can only speak of it in general terms.

MICHIGAN DENTAL LAW.—Commend us to a Michigan legislator for becoming modesty in viewing his own affairs, and for liberality and broadness of conception concerning those of others. The legislature of that State has made its own University, that overshadowing affair at the arbor of Ann, which is in the State of Michigan, the standard of comparison for the schools of the world, and graduates of any college whose requirements are not up to the arboreal University of Michigan, will not be permitted to practice in that bowery state. We do not know just what are the requirements at the shady retreat of the historic Ann, but while the home results of them are undoubtedly excellent, they are not generally reputed to be of such commanding and transcending pre-eminence as to dwarf a competing universe.

A NEW DEVICE.—From Dr. D. V. Beacock, of Brockville, Ont., we have received a simple appliance, which perfectly supplies the place of a more expensive one. It is a flash light for drying or annealing fillings in the mouth when wet, or when it is desired to again build on a part that has broken off. The device consists of a simple pipette, or drop-tube—a bit of glass-tube drawn to a point at one end and having a small rubber bulb upon the other. Into this a thread of wicking is drawn, with the end projecting from the point of the tube. It is partially filled with alcohol in the same manner that the rubber bulb mouth syringe is filled with water. When the wick is lighted a very effective flash light can be given.

TOOTHPICKS.—Quill toothpicks are undoubtedly the best that can be used. Metal is not sufficiently flexible, and will not penetrate narrow spaces, while it is not pleasant to the sense of touch. Wooden toothpicks are an abomination. When soaked with saliva they split, and not infrequently small splinters are driven down beside the tooth, causing inflammation and sometimes abscess or caries of the alveolars, through the continued irritation. Dentists, if they examine closely, will often find pieces of wooden toothpicks the cause of the great irritation about the cervical portions of teeth, the source of which has sometimes seemed unaccountable.

A NEW JOURNAL.—We have received the first number of *The Odontoskop*, a new dental journal established in Buda-Pesth, and the first to be published in the Hungarian language. Of its editor, Dr. Iszlai, we have kind remembrances in connection with the Berlin meeting of 1890, and we wish him the most abundant success in his undertaking.

PERSISTENT ADVERSITY.—The Chicago College of Dental Surgery has been sadly afflicted by sickness and death during the past winter. In December, Dr. D. W. Runkle, one of the demonstrators and a very promising young man, died. Dr. Joseph A. Swasey, only child of Prof. J. A. Swasey, and formerly a demonstrator in the operative department, also sickened and died. This was a sad blow, not only to his parents and near friends, but to a large professional circle. In January, Prof. Harlan was forced to go south on account of his health, while Prof. Johnson was in a precarious condition. In February, Prof. Belfield sickened, and for some days his life was despaired of. We are glad to say that he is near recovery. At least two other members of the faculty were temporarily disabled, and altogether the college has been decidedly unfortunate in this respect.

DECIDEDLY ILLIBERAL.— Four of the States of the Union have placed themselves outside all lines of professional sympathy, and have deliberately ignored all that has been done by way of advancing dentistry. They arrogate to themselves functions that only superior beings should assume. They refuse to acknowledge the diplomas of the most reputable colleges, and insist upon examining even the most carefully educated men themselves, before admitting their right to practice. If the dental profession of Massachusetts, New Jersey, Minnesota and Colorado can establish the fact of their own pre-eminence—for we assume that the laws passed are those asked by the profession of the State—their action may be justified. Otherwise it looks like a gratuitous and unnecessary indignity offered to a profession with which they are not in sympathy.

PERIODS OF GESTATION.—The periods of gestation are the same in the horse and ass, eleven months each; camel, twelve months; elephant, two years; lion, five months; buffalo, twelve months; cow, nine months; sheep, five months; reindeer, eight months; monkey, seven months; bear, six months; sow, four months; dog, nine weeks; cat, eight weeks; rabbit, four weeks; guinea pig, four weeks; wolf, ninety to ninety-five days. Geese set thirty days; swans, forty-two days; hens, twenty-one days; ducks, twenty-eight days; pea hens and turkeys, twenty-eight days; canaries, fourteen days; pigeons, fourteen days; parrots, forty days.

PULP EXTIRPATION.—Dr. John C. McCoy, in the *Dental Review*, recommends the following method for painless removal of the dental pulp. If it is exposed, a ten per cent. solution of cocaine is used in the cavity until full exposure can be secured, when the solution is injected into the pulp by means of a hypodermic syringe. After a few moments the pulp can be removed without any pain. To control the subsequent bleeding Hamamelis (Pond's Extract) is then injected; the canal is wiped out with an antiseptic, dried and immediately filled.

GOOD MORNING! GOOD BY!—A new journal, *The Dentist Himself*, was announced with a great flourish of trumpets, and the first number appeared in January last. We are now told that it has been discontinued because of the ill health of the editor and publisher. We do not know what arrangements have been made in favor of any subscribers that had been secured. A paraphrase of the lines upon the death of a very young infant may not be inappropriate:

"Since so soon the thing was done for,
We wonder what it was begun for."

THE FIRST DISTRICT DENTAL SOCIETY.—The anniversary meeting of the First District Dental Society during the past winter was a most unfortunate affair. It has produced a more bitter crop of dissensions and recriminations than any meeting within the period of our remembrance, and has left behind it a train of evil influences of which none of us will see the end. To whomsoever may properly belong the responsibility for all this, it will, of a necessity, be imputed to the men who were in charge of the meeting, and who managed to involve themselves and the Society in this most deplorable controversy. Those who are outside New York, and who have no personal knowledge of the incidents as they transpired, will probably say that if these men could not conduct a meeting without a public scandal, they should not have made the attempt.

A NOVELTY.—R. I. Pearson & Co., of Kansas City and Memphis, have issued a catalogue of dental goods that includes matter that is of unusual interest to dentists. It is something more than a catalogue, for it contains on every page one or more useful recipes or formulas needed in daily practice. The cut of some dental appliance will be given, and below it will appear plain directions for its use, perhaps, or some formula that may be used in connection with it. Thus the catalogue will serve a double purpose. We are under obligations to the publishers for a copy.

THE INTERNATIONAL.—Dr. Joseph Head has accepted the position of assistant editor of the *International Dental Journal.* This will relieve Prof. Truman of much of detail. It will enable him to turn his attention to matters of importance in the conduct of the journal, and still further to improve that which he has so much improved already, and to make yet more perfect a journal which he has brought to so high a state of perfection. Since the accession of the present editor, the tone of *The International* has materially changed, and it is now a leader in thought.

EIGHTH DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.—The Twenty-fourth Annual Meeting of the Eighth District Dental Society of the State of New York will be held in Buffalo, Tuesday and Wednesday, April 19 and 20, 1892, in the rooms of the Society of Natural Sciences, Buffalo Library Building.

A complete programme is being arranged by the Business Committee, and it will be presented in due time.

DISCONTINUED.—We regret very much that *Archives of Dentistry* is no more. It was always a reputable journal, and took its share in the work of elevating the practice of dentistry. It adds another to the list of journals started with high aims and great expectations, but which were not sufficiently sustained by dentists to warrant a continuance of the labor and expense involved.

KANSAS.—The Twenty-first Annual Meeting of the Kansas State Dental Association will be held at Fort Scott, April 26, 27, 28 and 29, 1892. Members of the profession are cordially invited to attend the meeting.

SERVED HIM RIGHT.—A dentist in Aix-la-Chapelle has been sentenced to nine months' imprisonment for pulling out all a woman's teeth while she was under anæsthesia. She wanted only one pulled.

THE

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THE DEVITALIZATION OF THE DENTAL PULP.

BY W. D. MILLER, M. D., PH. D., BERLIN, GERMANY.

The devitalization of the dental pulp has repeatedly been made the subject of communications to the dental journals, and of discussions in dental societies. Expression has often been given to the general complaint that application of arsenic to the dental pulp is too frequently followed by severe pain, and various means have been suggested for rendering that operation less trying to the patient.

My experience in the devitalization of pulps differs somewhat from that of many writers on the subject, in that I am able to perform the operation without pain; at least I have not had a single case in the last two years in which the patient has complained of severe pain after the application of arsenic, and in nearly all cases they have said they had felt nothing whatever. A description of the manner in which I devitalize pulps may, therefore, be of service to some of the readers of the DENTAL PRACTITIONER AND ADVERTISER. Not that I employ different materials from any one else, or use different methods, but I certainly do accomplish the result without pain.

With occasional exceptions, I adjust the rubber dam where arsenic is to be applied, then bathe the cavity thoroughly with carbolic acid, and remove the decayed dentine as thoroughly as possible without producing unnecessary pain. I find it desirable, as others do, to have a large surface of exposure to which to apply the arsenic, but I apply it to a small exposure rather than give the patient pain in the attempt to enlarge it. I now place two or three drops of carbolic acid upon a glass slab, and add as much of the hydrochlorate of cocaine as it will dissolve. A pledget of cotton, supersaturated with this solution, is placed in the cavity and left there while I am preparing the paste. I have in a small bottle a preparation consisting of equal parts of acidum arsenicosum and morphinum muriaticum, with just enough carbolic acid to hold them together (not to make a paste). I take a bit of this, a little larger than a pinhead, and make a paste of it with the saturated solution of cocaine in carbolic acid. I now remove the pledget of cotton from the cavity, take the paste upon the point of a suitably shaped excavator, and apply it directly to the point of exposure. Over this I place a small, flat pledget of cotton, well saturated with the cocaine-carbolic acid solution, being careful not to let the cotton extend over the margin anywhere, and avoiding every trace of pressure.

As far as the action of the cocaine is concerned, I have no doubt the same result may be obtained by incorporating the crystals with the ordinary thin arsenic paste usually employed. So far as I know, the following formula, which has been repeatedly recommended, would serve the same purpose:

℞— Acidi Arsenicosi,
Cocaine Hydrochlorate, āā. 0,5
Acidi Carbolici, q. s.
Ut fiat pasta mollis.

Personally, I have always used the fresh crystals of cocaine.

Now comes a very important part of the operation, that of retaining the application in position. If I had my enemy in the chair, and wished to make him atone in one night for all the sins he had ever committed, I would take some cotton, roll it up into a hard ball, saturate it with sandarac varnish, and force it into the cavity. The use of cotton and sandarac for retaining applications to the pulp appears to me to be utterly inexcusable. I think that one would be justified in calling it not only irrational, but slovenly practice. More or less pressure is absolutely necessary to make the cotton stay in place, and this is sure to increase the probability of pain in a high degree, to say nothing of the danger of causing minute quantities of the arsenic to exude and come into contact with the gums, while the cotton itself, unless packed very tight, soon becomes permeated with the secretions of the mouth.

The method of covering applications to the pulp with gutta-percha has also always appeared to me very objectionable, simply because it is next to impossible to cover the bottom of a cavity with a pledget of cotton, supersaturated as it should be with some local anæsthetic, and then fill over this cotton, wet with gutta-percha solution, so as to obtain anything like a watertight filling, without exerting pressure upon the cotton. For all cases where we have to enclose applications on cotton, the oxysulphate of zinc is vastly superior to gutta-percha. I use the preparation known as Fletcher's artificial dentine, but am not acquainted with preparations of a similar character which may be on the American market. I mix the preparation moderately thin, so that when it is taken upon the spatula it hangs down slightly. It should not, however, be thin enough to drop off. For inserting it, I use in most cases a very thin, sickle-shaped spatula. Taking a small quanity upon the end of the spatula, I draw it across the margin of the cavity, just about as one draws a plaster knife across the edge of a board to wipe the plaster off. I thereby fix the cotton on one margin; then in the same manner it is covered on the opposite margin, eventually a third or fourth portion being necessary to complete the operation. For approximal cavities in molars, an instrument bent upon its surface will sometimes be found preferable to a sickle-shaped one. The method of applying the cement is also somewhat different for molars, but a little experience will soon make the manner of manipulation apparent to every one. Like everything else, it requires some practice.

With the oxy-sulphate, or even with plaster of Paris, one can place a wet pledget of cotton in the open end of a tube ¼-inch in diameter, and fill over it without displacing the cotton, or exerting the least perceptible pressure upon it, a thing which cannot be done with gutta-percha, or any other material that I know of. My manner of applying arsenic was put to a severe test a few days ago in two quite similar cases, one of which I may relate. A middle-aged gentleman, of nervous temperament, presented himself, with an aching tooth on the right side of the upper jaw. An examination revealed a second molar, decayed on the distal surface. The cavity contained a pledget of cotton, the removal of which was followed by a paroxysm of severe pain, and a drop of pus was seen to exude from the point of exposure of the pulp. I make it a rule never to apply arsenic to an aching or highly inflamed pulp, but in this case, for special reasons, I decided to deviate from the rule. I at once inserted a pledget of cotton, saturated with the cocaine-carbolic acid solution, which was allowed to remain about five minutes, the pain gradually diminishing in intensity; I then asked the patient to rinse his mouth (not a necessary part of the procedure, however,) and renewed the application, which I left in the cavity while I was preparing the arsenic paste. The latter was applied as described above. When I had finished, there was still some grumbling pain, which disappeared gradually and entirely inside of ten minutes, and the patient did not have a trace of pain afterwards. The pulp could be extirpated on the following day. Thus the application of arsenic was made the means of completely stilling the pain, instead of producing the violent suffering so often complained of. In another case, two days ago, a young lady came to me with an aching tooth which had troubled her more or less every day for weeks. It was so sensitive that the touch of the finger, unless quite warm, produced severe pain. I applied arsenic with my usual care, and from the moment she left my office she felt nothing whatever to remind her that she had a decayed tooth.

I attribute my success in this operation to the observance of the greatest possible delicacy in making the application to the pulp, in particular to the avoidance of every trace of pressure, and secondly to the maintenance of a constant anæsthetic condition by use of the cocaine-carbolic acid solution.

GOLD.

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

Gold is a bright yellow metal, with the symbol Au., atomic weight 196, and specific gravity variously given from 19.26 to 20.72. Its melting point, also, seems to be a matter of dispute among authorities, it being estimated all the way from 2016° to 2590° F. When pure, gold is nearly as soft as lead, and is very malleable and ductile. One grain can be beaten out to cover an area of 56.75 square inches. Specimens have been made only $\frac{1}{367,500}$ of an inch thick, which is 1,200 times thinner than ordinary printing paper. Thin gold leaf appears green by transmitted light. One grain of the metal can be drawn into a wire 500 feet long, and will gild two miles of fine silver wire.

Gold is not acted upon by alkalis or the ordinary acids, nor by oxygen or water at any temperature. Neither does sulphur affect it, but it is dissolved by bromine or chlorine, or by any combination of chemicals in which free chlorine is present. This element, as it is generated in mixtures, is a powerful solvent of gold, and this is why *aqua regia* (four parts hydrochloric acid and one of nitric) acts so readily upon it.

Gold forms alloys with most of the metals, making compounds which are harder than gold, and more fusible. With mercury it forms an amalgam, and even mercurial fumes coming in contact with gold instantly combine with it and whiten it. The mercury may be driven off by heat.

Gold is mentioned in the oldest records of the human race. It is often spoken of in the Bible, mention being made of it as early as Gen. II., 12. It is always a symbol of purity or worth. In ancient times, gold appears to have been very plentiful, from the lavish use made of the metal. Immense quantities were employed by Solomon in erecting the temple of Jerusalem. It was fashioned into idols, gods, breastplates, wreaths, and even into robes, by interweaving gold wire with linen.

A story is told of Atahuallpa, the captured Inca of Peru, who agreed to bring together for his ransom, in the space of two months, articles of gold which should fill a room twenty-two feet long and seventeen broad, to the height of nine feet. When this was done, and the gold melted, it was found to be worth $15,480,710.

In estimating the value of gold, it may be interesting to know that a solid or cubic inch of fine gold weighs 10.1509 oz., and is worth $209.84. A cubic foot of the same $362,600. A cubic inch of standard gold weighs 9.0989 oz., and is worth $169.28. A cubic foot of the same $292,500. In the time of gold excitement in California, it was sometimes measured by the pint, and a dry measure pint of California grains weighs from 141 to 143½ oz., value about $2,560. It occupies about twice as much bulk in that form as when melted and cast into bars.

In the middle ages, the art of working gold appears to have been little practiced. The richness of the known mines was comparatively exhausted, and it was estimated that at the time of the discovery of America the gold and silver of the old world was reduced to about £34,000,000, and that the supply no more than met the loss by wear. Humboldt estimates that the annual amount of gold taken from America to Europe from the years 1492 to 1500 was $260.000. In recent times, the shipment of gold has been enormous, the exports in one year amounting to $55,178,229 in coin, and $12,754,257 in bullion.

Gold was first coined in England in 1257. The amount that passed through the English mint from the accession of Queen Elizabeth in 1558, to the 1st of January, 1840, was 3,553,561 lbs. troy. The value of gold coined in the reign of George III. was £74,501,586.

The standard of gold coinage in England is eleven parts of gold with one of alloy, while in the United States, France and Germany it is nine of gold to one of alloy.

Gold is very widely distributed in nature, it being found not only on land, but also to an appreciable extent in the waters of the ocean, where it is associated with silver. According to Lonstadt, a ton of sea water yields by a simple chemical process a grain of gold; so that the quantity of this metal thus held in solution must be vastly greater than all the gold ever yet extracted from the earth.

The principal countries where gold is found in greatest abundance are: The Ural Mountains, California, Australia, Persia, Japan, Venezuela, Southern Africa, Samoa, New Zealand, Ontario, Nova Scotia, New Brunswick, and to a limited extent in different parts of England, Scotland and Ireland.

The metal is found under various conditions, but the most workable deposits occur in veins of quartz, or in the more accessible drifts, which the breaking up of these quartz veins has helped to produce. Gold is not, as has been erroneously supposed, confined to rocks of any one geological period. In the Ural Mountains the drift is newer pliocene, having in it bones of the mammoth, etc.; in California it is of two different ages, but both, geologically viewed, comparatively recent. The gold of Colorado is found in veins, with metallic sulphurets traversing crystalline rocks of eozoic age, and the same is true of Ontario. In Nova Scotia and Australia, the deposits are supposed to be of the lower Cambrian age.

By the disintegration and crumbling away of rocks which contain the auriferous veins, the contents of these are swept down to lower levels, and the gold by its density always seeks the lowest places among the moving materials. Thus are produced the auriferous gravel deposits in alluvial formations, the golden sands of the rivers; and so they have been gathering for long ages past, and forming deposits, some of which are now seen in situations apparently out of reach of such agencies.

By washing away the intermixed earthy and stony matters, the metal is obtained in dust, flattened scales, small lumps and nuggets of all sizes and shapes, the larger pieces rounded by attrition, or ragged from the irregular forms they held in their original quartz matrix.

The writer now wears upon his finger a ring which was once a heavy, rough ring, studded plentifully with odd shapes and specimens of nuggets picked up by his father during the gold fever in California. One of the most beautiful and unique specimens secured by him while there was a nugget about three-quarters of an inch in length, somewhat flattened, and bearing an almost exact representation of the human foot. The five toes are distinctly marked, and are properly proportioned in size, from the great toe to the smallest. The proportions of the foot throughout are also well maintained, the piece presenting a rounded fullness at the heel, becoming narrow in front of this, and broadening out again just back of the toes. It is a rare specimen, and is now worn as a scarf pin.

Large lumps of gold have occasionally been secured by miners, as for instance the mass found in Cabarrus Co., N. C., weighing 37 lbs. troy, in 1810; the mass of 96 lbs. troy in Zlatoust, a district of the southern Ural, in 1842, and now in the imperial school of mines at St. Petersburg; a mass from Victoria, in Australia, which was exhibited in London, and weighed 146 lbs. 3 dwts. troy, of which 6 oz. only were estimated as matrix; and the still larger mass found at Ballarat, in that region, weighing about 185 lbs. troy. Probably the largest mass of gold ever found in one piece was the great Australian nugget known as the "Sarah Sands," which weighed 233 lbs. 4 oz. troy.

Gold is never obtained pure in nature, silver always being alloyed with it to a slight extent. The average of California gold is stated to be .875 to .885, while that of Australia is .960 to .966. The purest specimen is said to come from the Ural.

After gold is mined, the methods of extraction are mechanical, chemical, or both, according to circumstances. There are two methods of mechanical separation—by air and by water. The first is practiced in localities where water is scarce, and consists, briefly, in pulverizing the product of the mines, and then winnowing, on the principle of separating wheat from chaff. Washing is the usual method of mechanical separation. The operation is commonly called panning. It consists in placing the pulverized rock or earth supposed to contain gold in vessels, and stirring or shaking the contents under water in such a way that the finer earthy particles are allowed to escape over the edge, while the gold, with the larger stones or lumps of clay, remains behind. The stones are removed with the fingers and the lumps of clay reduced to a slime, and the washing continued till nothing is left except gold and a heavy, black sand, usually titaniferous iron, which accompanies gold in most localities, and cannot be separated by washing. When perfectly dry, a part of it can be removed by winnowing, and a part by the magnet. It is common to melt the finer dust with fluxes and collect it in buttons. Mercury is sometimes used in panning, to take up the fine gold. Besides the use of vessels, other methods of washing are resorted to, such as the rocker or cradle, and the sluice. Space will not allow a description of these, but they work on the principle of gold being heavier than the earthy mixtures, and thus falling to the bottom under a current of water.

Mercury enters extensively into the various processes of extracting gold, the amalgam thus formed being subsequently retorted, and the mercury, as it passes over from the retort, condensed in water and thus recovered. The gold is left in the form of a light yellow, porous mass, called retort gold. It usually constitutes 35 to 40 per cent. of the weight of the amalgam retorted.

The process known as chlorination is sometimes employed, whereby metallic gold is transformed by chlorine gas into chloride of gold, which can be dissolved by cold water and precipitated in the metallic state by sulphate of iron. This precipitate may then be filtered, dried, and melted with suitable fluxes to obtain malleable gold. This is acknowledged to be metallurgically the most complete method of extracting gold, but its cost, which is from $12 to $25 a ton, excludes its use for the lower grade ores.

When we come to consider the uses of gold, we are led to wonder what the world would do without this metal. It is impossible to enumerate in detail all of the various uses to which it has from time to time been made subservient. It is employed in the world of art, in medicine, and in commerce. It imparts beautiful hues to glass or porcelain. It is used for gilding in all imaginable ways. It forms the chief reliance of the jeweler in the manufacture of ornaments and as a setting for precious stones. In medicine its compounds have been used in the treatment of scrofulous diseases, and now within the past year the name bichloride of gold has been heralded from one end of the land to the other as a specific for inebriety. How permanent its reputation may be in this respect remains to be seen. It has long been considered one of the most important elements in the world of commerce. It is used extensively in the coinage of nearly every country, and is the standard for values wherever used.

And last, but to us the most important of all, is its use in dentistry. What would we, as dentists, do without gold? It makes one of the best bases for dentures, it is used as a coloring material in artificial teeth, it enters almost exclusively into the manufacture of crowns and bridges, and it is the filling material above all others which serves us best in operative dentistry.

Gold in its pure state is too soft for use in plates. Alloys are therefore formed with other metals, which, as before stated, increase the hardness and lower the fusing point. Different formulas are used for bases for artificial teeth, but the constituents are usually gold, copper and silver. For 18-carat gold plate there are two formulas: No. 1 contains 18 dwts. pure gold, 4 fine copper, and 2 fine silver; No. 2 is 22 dwts. gold coin, 2 fine copper and 2 fine silver. Gold plate 22 carats fine is 22 dwts. pure gold, 1 dwt. fine copper, 18 grs. silver, 6 grs. platinum. Gold plate for clasps, wires, etc., should contain sufficient platinum to render it firmer and more elastic. A 20-carat alloy for such purposes is made by two formulas: No. 1 is 20 dwts. pure gold, 2 fine copper, 1 fine silver, 1 platinum; No. 2 is 20 grs. coin gold, 8 grs. fine copper, 10 grs. fine silver, 20 grs. platinum. Gold solder is 66.6 gold, 22.2 copper, 11.1 silver.

Gold has probably displayed its usefulness in the art of dentistry more in the capacity of a filling material for carious teeth than in any other. Its advantages in this direction consist in the fact that it is indestructible; it is hard enough to withstand the force of mastication when properly condensed; it is not acted on chemically by any of the agents in the mouth, and will therefore not dissolve out or discolor; it will not change form when once properly adapted to the wall of a cavity, and, if used in the form of non-cohesive gold, it is easy of adaptation.

It is true that gold has some disadvantages as a filling material. Among these may be mentioned its conductive properties, whereby thermal changes are transmitted to the sensitive tissues of the tooth, and also the fact that it is quite seriously affected by moisture during its manipulation.

But, all of its qualities considered, gold is the best filling material, in the majority of cases, that we possess to-day.

In the preparation of gold for filling it becomes necessary to beat the metal out into foil. The process of gold-beating is somewhat as follows: The metal is melted and poured into a mould to form an ingot three-quarters of an inch high. This is annealed and hammered alternately, till it is reduced to about one-sixth of an inch. It is then passed between rollers till a thin ribbon is secured, and this is cut into pieces an inch square. One hundred and fifty of these pieces are piled up alternately, with pieces of tough paper or vellum, four inches square. Twenty vellums are placed above and twenty below the pile, and the whole bound with bands of parchment. The packet is then beaten on a heavy marble block with a sixteen-pound hammer. When the leaves are nearly the size of the vellums, they are taken out and cut into four squares, measuring an inch each way. They are then made into packets, with gold-beaters' skin alternating, and beaten with a ten-pound hammer.

In passing, it may be well to say something about gold-beaters' skin. The material is derived from the cæcum of the ox, which, being well cleaned, is doubled together, the two mucous surfaces face to face. In this state they unite firmly. The membrane is then treated with solutions of alum, isinglass, white of eggs, etc., and sometimes with creosote, and being beaten between folds of paper to expel the grease is finally pressed and dried. The leaves thus obtained, each 5⅛ inches square, are made up into molds, each composed of 850 leaves. It is estimated that the cæca of 500 oxen are required for a single mold.

Different manufacturers have different methods of preparing and manipulating the molds, and each man has a process individual with himself, which he usually retains a secret. Any attempt to gain special information on this point from the manufacturers has been met with a polite declination.

When the gold has been beaten by the ten-pound hammer till the pieces are four times their original size, they are again cut into four equal squares, and once more made into packets with gold-beaters' skin. This time a seven-pound hammer is used, and the gold brought to the thinness required for filling. The sheets are usually cut about 3½ inches square. They are then packed between leaves of books, and the books marked according to the number of grains in each sheet. For instance, No. 4 gold foil contains four grains to the sheet, No. 3, three grains, etc. No. 4 gold, therefore, will be just as much thicker than No. 3 as the addition of one grain of gold will make it. The numbers run all the way from 2 to 240.

Cohesive and non-cohesive gold are distinguished from each other by the fact that when two pieces of cohesive gold are brought into contact they will weld cold, while non-cohesive will not. The particles of non-cohesive will slide, one over the other, without cohering. This is an evidence that while both cohesive and non-cohesive gold may be chemically pure, only one of them — cohesive — is chemically clean. There must be something, no matter how minute, on the surface of non-cohesive foil to prevent the sheets from sticking together, for gold, when perfectly pure and clean, will weld at ordinary temperature.

Foil, when exposed to the atmosphere for any time, will coat over with an indiscernible film or gas, which renders it non-cohesive, and this must be expelled before the gold will become cohesive. It has been found that heat will do this to the best advantage, and it is on this principle that we anneal gold for filling. Reasoning from this hypothesis, all non-cohesive gold can be made cohesive by annealing, and while there may be one or two makes of non-cohesive gold on the market which cannot be rendered cohesive by annealing, it is probably due to the fact that they are not absolutely pure gold.

The special advantage of cohesive gold lies in the fact that on account of its welding properties it can be built out into contours, but this very tendency to cohesion renders it more difficult to adapt to walls and margins, from the facility with which the particles cling together and draw away from the walls.

The reverse is true of non-cohesive. It cannot be built into contours, but it is readily adapted to margins. The practical application, then, consists in employing non-cohesive gold in the bottom and along the walls of cavities, and cohesive on the exposed surfaces of fillings.

Corrugated gold is said to be prepared by charring a particular kind of unsized paper between the sheets. When cool, the gold is found to come out with a velvety, corrugated surface.

Crystal gold is made by precipitating the metal with an electric current. Plates of pure gold are suspended in a solution of auric chloride. These are connected with a battery, so that, as the solution loses its gold by deposition of the metal, it is re-supplied from the suspended plates.

The fact that this form of gold is precipitated in small particles or granules, renders it an excellent preparation for the bottom of deep cavities on account of its ready adaptation, and the rapidity with which it may be inserted. It builds up faster than ordinary gold, and generally remains in place in the bottom of a cavity much better during manipulation. But what it gains in adaptability it probably loses in strength ; *i. e.*, a filling built into a contour with crystal gold would not stand the same strain as one made with ordinary foil. The material is granular in its nature, and lacks the tenacity of fibre present in beaten foil.

He who attempts to prepare an exhaustive paper on the subject of gold is confronted with two dilemmas: First, the immensity of the subject (which taxes his judgment as to what shall be excluded); second, the great diversity of opinion expressed by authorities when treating on the properties of this metal. The preparation of the paper has raised in the mind of the writer a large element of doubt as to whether we really have such a thing as an exact science.

PYORRHŒA ALVEOLARIS.

BY H. J. BURKHART, D. D. S., BATAVIA, N. Y.

Read at the Twenty-fourth Annual Meeting of the Eighth District Dental Society,
held in Buffalo, April 19 and 20, 1892.

In presenting a paper on this subject, I feel as though an apology was due, because I am unable to offer you anything especially new. My purpose is briefly to narrate experiences with this disease while, with my brother, in charge of the practice of the Dansville Sanatorium, and to give you the observations I have made since. I have some statistics which I intended presenting, but am unable to do so from lack of time in which properly to tabulate them. As you are well aware, people who spend any considerable amount of time at institutions of the kind mentioned must, of necessity, at least start in with a full purse, and as a rule they are above the average in intelligence, investigations as to hereditary influence in the various diseases are more easy and reliable than in most cases.

I will not burthen you by a recital of the many and various theories of eminent practitioners as to the etiology of pyorrhœa alveolaris. Our literature is quite full, and yet no general theory has been accepted. Local, constitutional and bacterial theories, have been almost exclusively discussed of late. The latter has not received the attention the question merits. The advocates of local and constitutional causes are nearly equally divided.

That pyorrhœa alveolaris is a local expression of a constitutional disease, in a large majority of cases, I can prove most conclusively by my investigations. I have seen and had charge of one family of three generations, each being unmistakable cases of pyorrhœa, and within a year three families, two generations of which were in the same condition. Notwithstanding all this, I have yet some faith in local conditions as a cause in some instances. Nearly all of those who came under my notice were suffering from rheumatism, gout, local or general catarrh, dyspepsia, liver or kidney disease, or intemperance. By far the large majority were those of dyspepsia, and they of all others were most difficult to treat. Rheumatism and the various kidney diseases belong to the same category. Those of lymphatic temperament and scrofulous diathesis were practically incurable. A most marked peculiarity of the dyspeptic was the age, number of teeth affected, and scant discharge from the gums in extreme cases.

Middle life is the time pyorrhœa usually selects for an attack, and in a large percentage of cases in which dyspepsia was the exciting cause, the average age was about thirty. Right and left superior sixth and twelfth year molars and inferior central incisors were almost invariably the afflicted members, and why these particular teeth were the ones selected I should be pleased to have some one explain. There were many peculiar features observed, characteristic of the usual systemic disorder, an enumeration of which, at this time, would consume too much of your patience.

You are all familiar with the diagnosis of these cases. Where there is little tartar present and little inflammation, the prognosis is unfavorable; but where there is an abundance of tartar, a fairly safe prognosis can be made. Of course the general health plays a very important part in the conclusions arrived at. In the treatment, authorities do not widely differ. My plan is first thoroughly to remove all tartar, carious and necrosed bone, which can not always be done at the first sitting on account of profuse hemorrhage where many teeth are involved, and when there is general hypertrophy of the gum tissue. Amputation of the root of a tooth having more than one root I consider good practice, as the remaining roots are usually abundantly able properly to support the tooth. Just here let me contradict the assertion so often made in conventions, that a pulpless tooth is not liable to be affected by pyorrhœa. About the worst cases I ever saw were those of pulpless teeth, and as a general thing they could not be saved. I did not take the patient's word in regard to the canal having been filled. In several cases I had performed the operation myself, which seemingly was a success. The pus pockets should be evacuated by the injection of peroxide of hydrogen, and where there is any considerable amount of congestion, free lancing should be resorted to.

Where the teeth of one or both jaws are affected, I am a firm believer in the heroic treatment, as advocated by Dr. Riggs. The next consideration should be fastening of the loose teeth, and right here there is a great diversity of opinion as to the right kind of an appliance. Swaged cusps of copper, connection by means of gold fillings, ligating with floss silk or gilling twine, and metal bands, have all been used. The swaged caps have been discarded by me on account of the time required to construct, the difficulty of obtaining a correct articulation, and the offensive taste. Connecting by means of gold fillings I consider impracticable, except in a few isolated cases. The dirty, pestilence-breeding floss and gilling twine I have no use for. My preference is for a band of either gold or platinum, 35 gauge and a quarter of an inch wide, made large enough to encircle all the teeth affected, and where there are only a few afflicted, one or two healthy teeth on each side. Wherever it is possible the rubber dam is applied, and if that can not be conveniently done, napkins are resorted to and the teeth thoroughly dried. Oxyphosphate of zinc is then thinly mixed and spread or smeared over the labial and palatine surfaces, and the band slipped up about midway between the gum margin and occluding surface. Next, fine binding wire of silver or platinum is slipped through the gum margin, from the labial to the palatine surface, brought between the teeth near the incisive edge, and back to the gum, twisted, and the slack taken up. This is repeated in each space, and when the last one is reached you have all of the teeth firmly bandaged. Care should be taken to allow the patient to close the mouth frequently during the process of wiring, so that loose teeth are not drawn out of position. With the aid of the burnisher, a few blasts of hot air and the removal of surplus cement, the case is completed. This gives you a firm, strong, clean bandage, quickly constructed and applied, and comfortable for the wearer. Local treatment should be given every day for a few weeks. As a solvent, pure sulphuric acid has been very successful in my hands. For the gums I use tincture of iodine, salicylic and tannic acids, and a wash composed largely of hydronapthol, have proved very efficient. Where the secretions of the mouth are offensive, five or six grains of chloride of zinc to an ounce of water, used as a gargle, is very beneficial. Remedies must be frequently changed to meet the varying conditions.

When it comes to constitutional treatment, I always try to work in harmony with the family physician. Cathartics, tonics and alteratives are decidedly useful. If the disease is due to an enfeebled condition of the body, digestive stimulants and plenty of exercise in the open air are indicated. If it is due to any particular cause, such as rheumatism, dyspepsia, etc., strict attention should be given to proper constitutional treatment to correct the exciting cause. Sponge grafting I have tried, but not with any appreciable good result. Thorough cleanliness should be insisted upon, and the mouth kept in as nearly an aseptic condition as possible.

Just a word in conclusion as to the application of crown and bridge work in mouths of pyorrhœal patients. I am a thorough believer and an advocate of crowns and bridges in the right place, but this is not in mouths where there is any considerable recession of the gums or indications of pyorrhœa. I can speak feelingly on this phase of the question, because of numerous funerals of my own and others. Within two years I have removed several bridges and crowns where the work had been well done. Last fall a gentleman came to me with a bridge in the lower jaw, attached to a canine, second bicuspid, and twelfth year molar, so loose that I removed the whole business with my fingers without the least trouble. The work had been beautifully done by a competent dentist, but the mistake was in the selection of the mouth. This is only one of numerous cases. I thoroughly believe that no tooth in a mouth where pyorrhœa is present should be made to assist in supporting an appliance of any kind, or to do more than the work intended for it. I have several bridges in mouths with a predisposition to pyorrhœa which apparently are all right, but I have little faith in their permanence.

OBTUNDENTS AND LOCAL ANÆSTHETICS.

BY DR. FRANK W. LOW, BUFFALO, N. Y.

Read at the Twenty-fourth Annual Meeting of the Eighth District Dental Society, held in Buffalo, April 19 and 20, 1892.

So many different preparations are employed for producing local insensibility to pain, that I shall not attempt to classify them further than for convenience of discussion to divide them into three general classes.

1st. Liquids,—either rubbed *upon* the gum, injected *into* it, or introduced into a cavity of decay.

2d. Dehydration, by means of medicated hot or warm air blasts.

3d. Refrigeration, accomplished by rapid evaporation of some ethereal liquid, which rapidly reduces the temperature and produces intense cold.

Of the first class, such as are injected hypodermically, I know nothing, save that in a general way they seem to be constructed on the grape-and-canister principle. Never having fired one of these hypodermic mortars, I am disqualified from judging either of their force of penetration or power of destructibility.

With the nostrums that are rubbed upon the gum, for the purpose of alleviating the pain attendant upon extraction, my experience has been very disappointing, for I find that I am altogether wanting in the occult power of producing hypnotism.

With liquid obtundents used in the carious cavity of a tooth, I have witnessed every shade of every degree, I think, both of success and failure. I may almost truthfully say that among them all I have never found one either better or worse than the rest of them, and I may add even more truthfully, that with the very best of them the percentage of cases where the suffering of my patients has been to any appreciable degree ameliorated, does not exceed the ratio of one to ninety-nine. Yet the following is a modest sample of the claims of the average self-styled "original inventor":*

DR. WURST. PEINMANN'S LOCAL ANÆSTHETIC OR KING OF DENTAL MEDICINE.

PAINLESS EXTRACTION OF TEETH!! PAIN OBTUNDER IN SENSITIVE TEETH!! FOR IMMEDIATE WEDGING FOR FILLING!! MAGIC TOOTHACHE CURE!! IN SCALING TARTAR UNDER MARGIN OF GUMS!!

DIRECTIONS.

FOR IMMEDIATE WEDGING! Rub gum freely and wait until they become numb, then apply your wedge and youll be ready for filling with no suffering to the patient

IN SCALING TARTAR UNDER MARGIN OF GUM! Where tartar is under gums, the gums become irratate and highly inflamed, and are very sensative to work with, by rubbing the gums you can proceed with pleasure and ease to patient

MAGIC TOOTHACHE CURE! There are some people that want something for toothache, who fear to have their teeth extracted or filled. Take small pledge of cotton, after removing decay, then place it in cavity and seal with cotton sandrick varnish. They will be delighted with the immediate releef and willing to pay your price.

To the end of time it will probably prove time wasted to investigate or experiment with this class of remedies.

As to medicated hot air blasts, the best apparatus for their administration, I think, is the one recently invented with a double bulb, the medicament apparently consisting of an essential oil of cinnamon. I borrowed one from a brother practitioner recently, for experimentation and comparison with another obtundent of which I soon shall speak. Whether it is the continuous stream or jet of warm, dry air, or the medicament itself, I know not; but, without itself causing pain, it did partially obtund the dentine of a previously sensitive tooth.

Of the third class of dentine obtundents, a jet of nitrous oxide is usually effectual, but its application must be persisted in for no inconsiderable time, and almost invariably it causes very considerable suffering.

Chloride of ethyl and chloride of methyl are the latest aspirants to professional and public favor, and are very nearly related. Let us study as well as we may their essential difference, especially as to mode of evaporation and the degree of refrigeration they are capable of producing. By this means we may hope to arrive at some definite conclusion regarding their respective value and limitation.

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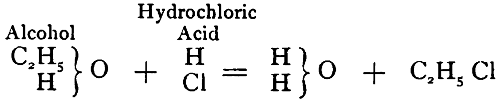
* If this abstract is an indication of the erudition of the great "Original Discoverer," it denotes its probable value. It is printed *verbatim et literatim*. [EDITOR.

Ethyl chloride (C_2H_5Cl, specific gravity 64.5) is a colorless, white, ethereal liquid, boiling at 51.8° F. It is obtained by passing gaseous hydrochloric acid through ethylic alcohol to saturation, and distilling over a water bath. The equation is:



$$\overset{\text{Alcohol}}{\left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}O} + \overset{\text{Hydrochloric Acid}}{\begin{matrix}H\\Cl\end{matrix}} = \left.\begin{matrix}H\\H\end{matrix}\right\}O + C_2H_5Cl$$

It comes to our hand for use sealed in a glass capsule, by breaking the tip of which we open a minute orifice. The heat of the hand is sufficient, when applied to the outside of the glass, to cause rapid evaporation, and if the liquid is allowed to cover the minute orifice, a fine jet or spray can be injected into the carious cavity.

Dr. M. L. Rhein, of New York, who has experimented more extensively and systematically than I have, writes me that by this method he has been able to reduce the temperature to 14° F., but that it sometimes takes nearly or quite three minutes to accomplish this.

My observation has been, that with those teeth in which we most need to use an obtundent, its effects are of brief duration, with intense pain, followed by complete or nearly complete anæsthesia. In teeth whose dentine is of a dense quality, its effects are accomplished much more slowly, and the accompanying pain seems to be, not only of longer duration but of greater intensity, as well as complete or very nearly complete anæsthesia, and in less time than I have ever been able to produce it by the use of nitrous oxide gas.

Methyl chloride (Ch_2Cl, specific gravity 50.5) is a colorless gas, slightly soluble in water, having a sweetish taste and odor. It is obtained by distilling together (SP_4H_2) sodium chloride and methylic alcohol—wood alcohol. Condensed to a liquid, in which form, incased in strong, hardened copper cylinders we have it for our jets, its boiling point is 7.6° below zero. Note the difference here. Ethyl chloride boils at 51.8° above, methyl chloride boils at 7.6° below zero. Dr. Rhein says he is able to cause a reduction of temperature with methyl chloride to 40° below zero in five seconds.

Dr. Rhein adds:

"The advantage of the methyl consists in the immediate production of insensibility and the lack of penetration of the cold, owing to the small amount required. A single blast of the methyl for just two seconds, applied direct, will leave the dentine at that spot insensible for two minutes. I prefer repeated applications to the use of too much at one time. Care should be taken, however, to open the valve wide so that the rush of methyl should be as powerful as possible, as it has a very strong bearing on its great superiority over the ethyl tubes. In fact, I would not be surprised if the ethyl was placed in a powerful cylinder, under the same power of compression as is used for the methyl, that we would then find the ethyl possessing the same advantage. This is mere surmise. It may still lack the intense volatile power that causes the methyl instantly to assume a gaseous form when exposed to the atmosphere."

But whatever the obtundent used, it demands care and attention to every detail in its application; and even then, in many instances, it will be found that the annoyance and the pain caused by the application will exceed that which would be produced by perfect instruments and great care on the part of the operator, without an obtundent.

The many nostrums that are advertised for sale by the ignorant "great original discoverers" depend almost universally upon the presence of cocaine for their obtunding power, and nearly all of us have tried that enough to know how valuable it is. The "discoverers" add some drug or drugs to it to disguise it, but which usually have as much obtunding power as so much water, and no more.

Here is one of these shot-gun mixtures used by a "specialist in painless extraction," who advertised extensively and traveled the country over, posing as a great discoverer and a wonderful operator:

Hydrochlorate of Cocaine,	grs. x
Essence Peppermint,	gtt. v
Alcohol,	gtt. vii
Carbolic Acid,	gtt. iij
Boric Acid,	grs. iij
Distilled Water,	oz. j

It will be seen that there is absolutely nothing here that is of the slightest benefit, save the cocaine; in fact, some of the ingredients are "incompatibles." Three drops of carbolic acid in this mixture would have about as much effect as the seven drops of alcohol, and that would amount to about as much as for a man with a good-sized "jag" on to breathe twice in the bottle. Yet the above mixture received the approval of a Dean of one of our dental colleges, an author of great repute in dentistry.

The "original discoverer" continued to use his wonderful preparation until he got a case of cocaine poisoning, when the patient commenced an action for damages against him, whereupon he disappeared from the scene of action with great celerity, and the places which knew him once have since known him no more. His lawyer obtained the prescription for the mixture which he used, and through him it is given to the world.

The experience, not only of dentists, but of physicians, proves that cocaine, when injected hypodermically, is very uncertain in its action, and that its exhibition is attended by too many dangers to make its use a practice to be unreservedly commended. When applied to mucous surfaces its effects are almost magical, but its introduction directly into the circulation should only be attempted with the greatest caution.

SHAPING APPROXIMAL CAVITIES IN INCISORS.

BY DR. W. W. COON.

Read at the Twenty-fourth Annual Meeting of the Eighth District Dental Society, held in Buffalo, April 19 and 20, 1892.

Little need be said of simple cavities in approximal surfaces of superior incisors. Their demands are simple, though imperative. The necessaries are, sufficient room and a preparation leaving strong walls with little undercut. I apprehend that the trouble met with in this class of cavities arises from disregarding the first demand, and attempting to fill the cavity around a corner, with cohesive gold alone.

It is of the large approximal cavities, involving the cutting edge, that I wish to speak and hear you talk. My reading of this class of cavities (which has not, by any means, been exhaustive) has sometimes made me wonder at the vague manner of treating the subject. Dr. Louis Jack's article in the second volume of the *American System of Dentistry*, on "The Stopping Process with Gold and the Related Procedures," says of "Proximate Cavities of Front Teeth extending to Cutting Edge, the Labial Wall being Frail":

> "Sometimes in this class of cases so much destruction of tissue has occurred as to extend the carious action to the cutting edge. The treatment of the case then becomes very tedious, difficult and hazardous. When the pulps remain alive, the retention depends upon the depth of the cutting at the stronger and thicker parts of the tooth, at the base of the cavity. No specific rules can be laid down to meet the varying contingencies which arise with each case. It may be stated, however, that nothing short of a complete restoration of form in these cases is acceptable; and when the amount of gold displayed becomes extreme, it is often a question whether some form of substitution be not better than a laborious restoration, which is peculiarly liable to destruction through use, or the accidents to which the front teeth are subject."

We do not oppose the above quotation, but we want to know more about the detail of it. We need definite ideas of getting the greatest amount of retentive form, with the least irritation of the pulp and weakening of the crown, so that when the "contingencies that arise with each case" are not contra-indicative, we may proceed with some system. Differing methods will meet the contingencies.

The one concerning which I wish to speak is this: The cavity is entered from the palatal aspect, unsupported enamel being cut from that surface. As much labial wall is left as the quality of the tooth will admit. Carious parts being removed, the walls are smoothed, being beveled outward. The cervical wall is made a right angle to the cavity, and is left solid, not being used for undercut. The finished gold plug following the outward bevel of the enamel edge of this wall is a source of strength at this vulnerable point, which, when used for a groove undercut, presents a formation most conducive to a future patch requirement.

The labio-cervical portion admits an undercut that does not weaken the cervical wall, and will not so nearly approach the pulp as would a groove formed in the cervical wall. Commencing, then, from this, the main undercut formed well up under the cervical portion of the labial wall, a groove is made to extend toward, but not to, the cutting edge, following the labial wall and cut in the dentine. At a safe distance from the pulp, this groove crosses the cavity; or by use of a pit undercut, which extends in the direction of the pulp rather than toward the cutting edge, it connects with a groove which follows the palatal to the cervical wall, where it ends in a retaining point, or larger undercut at the junction of the palatal and cervical walls as indicated. Very often little or no groove is practicable between the basilar ridge and the pit between the pulp and cutting edge, but it may usually be a well defined one over the basilar ridge.

The filling is commenced in the labio-cervical undercut. Direct access is had to all parts of the cavity from the palatal aspect, which admits the use of any form of plugger, malleting, or hand pressure.

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AMERICAN MEDICAL ASSOCIATION—SECTION OF DENTAL AND ORAL SURGERY.

The forty-third annual meeting of the American Medical Association convened in Detroit, Mich., June 7, 1892. The meeting was an unusually large one, and the work done was important. The hospitality of Detroit was severely taxed to entertain the delegates, but it was all sufficient. The Association has seldom been so well and so handsomely cared for. The receptions and excursions were numerous and brilliant.

The Section of Dental and Oral Surgery met in Fraternity Hall. Its chairman was Prof. J. Taft, and its secretary Dr. E. S. Talbot. At the commencement, the chairman delivered

THE ANNUAL ADDRESS.

He said that a retrospect of the professional work of the year afforded much room for encouragement. There is a constantly growing interest in all that pertains to professional matters, on the part, not alone of the leaders in thought, but of the younger men as well. There is a feeling of intolerance toward those who would retain for selfish purposes useful information that might come into their possession. Educational matters are assuming a new phase. Didactic teaching is becoming of less importance, and clinical demonstrations are taking their place. Museums and libraries are being founded. Dental schools are increasing in number, and it is a significant fact that the most of these are in connection with universities or medical schools, the teaching in the foundation branches being in the medical classes, thus giving the dental student the same broad training that the medical matriculant has. It seems remarkable, also, that this alliance has usually been primarily sought by the medical school or university. This seems prophetic of great things in the future.

The standard of the colleges is being gradually raised, while the number of dental students is constantly increasing. Preliminary education is now demanded, and thus a better quality of material out of which to make dentists is being secured. Apprehension is felt on the part of some that colleges are becoming too numerous, and that too many graduates are being turned out. Those who so express themselves should remember that this will, in the future, be the only door into practice, and that the need for dentists is constantly increasing. Those who are least competent will drop out of the profession, and thus a better grade of practitioners will be secured for the future. There is no danger that too many competent men will be graduated. A sufficient authority has said that there are "not enough now of well equipped dentists in the United States properly to cleanse and keep clean the teeth of the people of this country who need such service," to say nothing of other work that is demanded. The thirty colleges last year turned out 1,430 graduates. Of these, ten per cent. were foreigners, and another ten per cent. will never enter full practice, while five per cent. will become teachers and specialists, thus disposing of twenty-five per cent., and leaving but about 1,000 to supply the constant dropping out and the increased demand. So there need be no apprehension as regards the number of graduates from the colleges. What is needed is a still broader training, and higher qualification for matriculation. When this is secured, and every one who enters upon practice shall be fully equipped for his life work, there will not be too many dentists, or too many colleges.

A paper was presented by T. D. Crothers, M. D., of Hartford, Ct., upon

SOME FACTS RELATIVE TO DISEASES OF THE TEETH AND JAWS IN INEBRIATES.

He said that from the clinical and neuralogical standpoint, a large proportion of the hereditary cases of inebriety have defects and degeneration of the face, jaws and teeth. No degeneration that can be said to be specific to alcoholism can be traced, but the inebriates from hereditary and other causes have defects, retarded growths and malformations, that are the result of such heredity. The frequency with which congenital defects of the head and face appear in inebriates, suggests a pathological relation. Inebriety is often only developmental disease, beginning in embryonic life, and it manifests itself in abnormalities of various kinds, as well as in a neurotic condition that produces insanity, chorea, epilepsy, hysteria or abnormal sensitiveness. To these may be added deformed or partially developed maxillaries and palatal arches.

How far these departures from the normal may be accepted as evidences of neurotic or alcoholic diathesis, is a question. The teeth of hereditary neurotics are different in shape and structure from those of different heredity. The effect of alcohol in excess upon the teeth may, in general, be said to be that of an irritant, which impairs the vitality of their formative organs, and thus makes them inherently weak and imperfect. All the tissues become the seat of degenerative processes, yet it is not exhibited in all alike. The pulps of the teeth in such instances frequently die, and the gums recede. Inebriates, as a rule, suffer from their teeth, and are obliged to seek the aid of the dentist early. A large proportion of those under my care have dental disturbances of various kinds. Irregularities are very common, and when teeth are extracted the jaws early take on that degree of absorption that usually marks senile jaws. High, narrow palates, with projecting lower maxillaries, are very common in those who are hereditary inebriates. I have traced these peculiarities in different families, some of the members of which have been under my care.

A thin, high-pitched, weak voice is another sign of this neurotic inebriate tendency. The observations of Dr. Talbot upon this subject are abundantly confirmed by my experience. Deformed palates and teeth are very common among all neurotics, owing to the retarded and arrested, or overstimulated growth.

From a clinical point of view, a deformed palate may be taken as an unmistakable sign of neurotic degeneration. The inebriate who has this deformed arch, with defective maxillary growths, has received from his ancestors a pathological bias which will make cure extremely difficult.

Dr. Clauson, in his work on "The Neuroses of Development," says there is no such thing as a high or V-shaped palate in any animal, or in any aboriginal race, from the Australian native upward, and hence they belong, like the usual neuroses, to our higher civilization. The theory that deformed palates are due to thumb-sucking in infancy is baseless. Idiots are notoriously free from thumb-sucking, and yet they have very often projecting teeth and jaws. The deformity of the palate occurs during brain growth, early in life, probably *in utero*.

DISCUSSION.

Dr. E. S. Talbot: The author of this paper is connected with an institution that offers him unusual opportunities for observation concerning neurotic, and especially inebriate, tendencies. But I must take issue with him on certain statements. Inebriates are to a certain extent neurotics, but that these conditions extend to intra-uterine existence is not true, and I cannot conceive that a dentist would make this mistake. We never find these aberrations in the deciduous teeth, and therefore they cannot be traced back to fœtal life. We do know that many of the aberrations are hereditary, and therefore they appear only in the full life and complete growth of the permanent dentition.

For some time I have been making examinations of the teeth and jaws of inebriates at the different asylums devoted to their care, especially at the Keeley Institute, at Dwight, Illinois. I have examined about 750 cases, and have found a greater proportion of general aberrations than among idiots and the insane. There are, however, very few V-shaped palates among them, while they are common in the ordinary criminal classes, and among the insane and idiotic. The usual departures from the normal in the inebriate classes are the partial V-shaped, and the saddle-shaped arches. Among the insane and idiotic there are twice as many high vaults as in any other class. Inebriety is a disease, and the inebriate is born so. He is like other neurotics; the tendency is inherited, and if it does not manifest itself in this way he will be neurotic in some other direction. He will be an egotist, an enthusiast in some particular, as in music, or even an intemperate advocate of sobriety. The undue nervous tendency will in some way manifest itself. The aberrations in the teeth are inherited, as the neurotic tendency is hereditary. This tendency may make of him an inebriate, and it may induce aberrations in the teeth, either or both proceeding from the same cause.

Regarding deformaties of the lower jaw. At the Keeley Institute I found in 100 cases that a large majority had arrested development of the nose and face, and this quite marked. As the lower maxilla develops entirely independent of the upper, it is sometimes the case that this has developed while the other has not, and thus produced a deformity.

Dr. M. H. Fletcher, Cincinnati, O.: Is there any connection between defective teeth and defective brains? They are developed from quite different membranes. What connection can there be? The enamel of teeth is derived from the epiblast, the dentine from the mesoblast, and this may account for the differing conditions in these tissues, even in the same tooth.

Dr. W. C. Barrett, Buffalo, N. Y.: I understood the essayist to say that there was nothing approaching the deformed arch to be found in aboriginal people, or in any animal order. I think this an error, because this tendency to a saddle-shaped arch is an approach to that of the orders nearest allied to homo. In most of the primates there is nothing like the arch of man, but the line of the teeth is drawn in at the sides, while that of the incisors is almost straight. In the gorilla, for instance, the mammal which nearest approaches man, the saddle-shaped arch is normal. Of course it is a regular and not a deformed saddle-shape, but there is a distinct drawing in of the line of the pre-molars and molars, so that the buccal line is concave instead of convex. Hence the saddle-shaped arch seems like a tendency toward the animal condition.

DR. TALBOT: In answer to the observation of Dr. Fletcher, let me say that there may be an inherited tendency toward certain forms of development, or a lack of development. This may be manifested in the brain, or in the teeth, but that a lack of brain development should in any way cause a lack of bone growth I cannot conceive. The arrest of development at six or seven years of age is hereditary. It is not usually due to local causes. In micro-cephalic idiocy the stoppage is usually at about this age. The literature of the subject is exceedingly scanty. But two persons besides myself have, so far as I am acquinted with the subject, contributed anything to it.

Upon motion the subject was then passed.

G. S. Junkerman, M. D., D. D. S., of Cincinnati, Ohio, then read a paper upon

ORAL MANIFESTATIONS IN METALLIC POISONINGS.

He said that many metallic poisons which are non-corrosive in character, show the limit of their exhibition in the human system within the oral cavity. Some of the corrosive poisons also exhibit the same symptoms. There is a theory which is not, however, based upon any authenticated case, that arsenic, in proper doses to give a medicinal effect, may result in the death of the pulp of one or more teeth. Arsenic has a predilection for affecting the glandular tissues, and if it accumulates in the liver, spleen and kidneys, why should it not do so in the lymphatics of tooth pulps? Arsenic does not always destroy by corrosion, but may cause death by over stimulation.

If arsenic destroys the inner, the external vitality of teeth may be endangered by mercurial poisoning. These effects are peculiarly marked in the oral cavity. The death of pulps, too, often results from murcurial poisoning, arising from placing a mercurial filling in too close proximity to it. The most skilled operator cannot possibly give to a certainty the correct prognosis of a tooth filled with an amalgam filling. Teeth in which have been placed large quantities of amalgam rarely retain the vitality of their pulps for any length of time. The injury from the much talked of evaporation of mercury pales into insignificance beside the cases of the absorption of the mercury by the caniliculi, from the inner walls of fillings. The evaporation of mercury from fillings after they have become perfectly set, is a theory founded mostly on imagination. The absorption by the dentinal tubuli is a well authenticated fact.

The oral manifestation of lead poisoning is characterized by a blue line at the margin of the gums, usually on the inferior central incisors. In the internal administration of this drug, the slightest appearance of this line marks the beginning of plumbism. It is claimed that this blue line is due to the deposition of sulphide of lead, and is only found in the mouths of individuals who do not use the tooth brush, but I have found it in scrupulously clean mouths, and where all mechanical means for removing it were futile. Mercurial poisoning will sometimes produce the blue line, but in such cases it will not be confined to the front teeth.

Sometimes it is difficult to distinguish between lead poisoning and the early stages of pyorrhœa, but the history of the case should determine this, as lead poisoning will produce constitutional symptoms, while pyorrhœa results in pus. This lead poisoning may arise from the use of tooth powders. Powdered acetate of lead is usually the ingredient used, and its supposed virtue lies in its styptic and hæmostatic qualities.

DISCUSSION.

DR. FLETCHER: I use arsenic as a germicide in pulpless teeth, but I have seen no evil effect. As regards the blue line of lead poisoning, I have never seen a case, but have witnessed the blue line due to other causes.

DR. BARRETT: I can fully comprehend the corrosive effects of arsenic, but I cannot understand how it kills by over stimulation. When used in the devitalization of teeth, it has been supposed that it might produce its characteristic effects by an irritation—which may be a kind of over stimulation—and which produces such inflammation as to induce strangulation at the apical foramen. But it produces the same effect when applied to pulps in young teeth, in which no apical foramen has as yet been formed. It does the same when brought in contact with the buccal tissues, causing a corrosive ulcer. It will destroy a part of the pulp sometimes, leaving the root portions alive, which could not be the case if it produced its effects by strangulation and stasis. I believe that it is a corrosive poison, and that it acts only as such, destroying the tissues with which it comes in contact, through its corrosive action.

As regards the discoloration of teeth by amalgam fillings, I never have seen evidence sufficient to lead me to believe that any free mercury could penetrate the dentinal tubuli. I should much sooner think that some chemical change took place in others of the ingredients, and that perhaps the silver caused the blackening.

Dr. A. E. Baldwin, Chicago: The essayist speaks of lead dentifrices. He evidently knows whereof he affirms, but I have never heard of them before. Dr. Barrett affirms that arsenic causes death in children's teeth when the foramen has not yet been formed, yet this might be by strangulation, through the peculiar character of the blood vessels. In pulpless teeth you will sometimes find constricted portions above the apical foramen. I am not a microscopist, but I can imagine a chemical obstruction in the blood vessels, aside from that of the bony walls of the dentine.

The discoloration of teeth under amalgam fillings is due to chemical combinations. The mercury could only be carried into the tubules as a vapor, and so I cannot accept the theory that the absorption of mercury by the dentine causes discoloration. Years ago dentists decried the use of amalgam, because of the liability to mercurial poisoning. I believe that personal idiosyncracies govern the manifestations of mercury more than of any other poison. Some persons are affected by the smallest portion, if it comes in contact with the skin, while others seem to possess immunity to its effects.

Dr. W. W. Allport, Chicago: Regarding the method of the destruction of the dental pulp by arsenic, it is still an open question. I have never seen anything that could definitely settle it. It is well known that it takes longer to devitalize the pulp in a child's tooth.

I am inclined to the opinion that the absorption of mercury into the dentine is scarcely probable. That there is evaporation from the surface of an amalgam filling there can be no doubt, but it must be infinitesimal in amount, and I think not enough to cause any serious disturbance.

Dr. J. Taft, Cincinnati: All who have used arsenic have found that when a little has oozed out of the cavity it corrodes the tissues and induces a slough. Sometime ago, some one advised that if a firmly set tooth were to be extracted, a string soaked in a solution of arsenious acid should be tied about it, beneath the gum margin, when it would immediately begin to loosen. This is true, but it must be by a devitalization of the tissues and sloughing. Exactly how arsenic does this is not known, but we do know what are the effects.

If microscopic sections of a porous tooth, that has been filled with amalgam, be made through the discolored part, the stain will be found at a considerable depth. This has been produced by the penetration of the vapor of mercury into the tubules, and its oxydation there. The vapor of mercury is exceedingly subtile, while in all fillings of amalgam there is an excess of mercury. There may be a large amount of free mercury, and this will volatilize, even at the freezing point. In the distillation of mercury I have never been able to make a joint so tight that the vapor would not escape. It has been stoutly affirmed, and as stoutly denied, that the vapors of mercury will produce constitutional symptoms.

DR. TALBOT: Some years ago I had three cases of poisoning from amalgam fillings. I took a very delicate test for mercury, and moistened paper with it. This was placed over the mouths of bottles in which were confined amalgam fillings, some of which had been in the mouth for thirty years, and in every case the tests were blackened. Some persons are exceedingly sensitive to mercurial influence. I am one of these. If for three days I should each day mix an amalgam filling in the palm of my hand, I would have paralysis agitans. I know a number of others who are equally susceptible. Why may it not be the case, then, that the amount of mercury in a filling may effect some persons injuriously?

On motion the subject was passed.

A paper was presented by E. S. Talbot, M. D., D. D. S., upon

THE ARREST OF DEVELOPMENT AND DECALCIFICATION OF THE ENAMEL AND DENTINE.

The essayist said that the conclusions arrived at in the paper were the result of the study of four cases. The first was that of a Miss C., twenty-four years of age. Her jaws have gradually come closer together, owing to a wearing away of the teeth, the front ones more than the back ones, so that there was considerable space between the upper and lower incisors. Occlusion was so bad that she was unable properly to chew her food, and mastication was imperfectly performed with the vault of the mouth and the tongue. Owing to this use of the tongue, it was hypertrophied to such an extent that speech was interfered with, and she was a constant sufferer from indigestion.

The teeth were of a dark yellow color, containing grooves and pits, indicative of arrest of development. The bicuspids were the only ones with any semblance of normal contour. This wearing away was not due to attrition, because they were very rough upon their grinding surfaces, while the roots not in occlusion were smooth. The enamel and dentine were so soft that they could be cut like old cheese. The pulps had entirely receded from the crowns, and no canals could be found in the roots. Other children of the same family had a similar condition. The mother said that she had given oatmeal and like coarse foods freely during childhood. The father's teeth were like those of the children. The paternal grandfather and grandmother were both of a nervous temperament, and in all the teeth were early erupted.

Case number two was that of an exceedingly nervous child of eleven years. Her bones were small, and she was but poorly developed. The teeth were so covered by tartar that it formed a continuous band, enveloping all of them on each jaw, and to such an extent that it was impossible to locate any individual tooth. She was so nervous that the mere removing of it would nearly cause spasms, and, when cleaned, two weeks was sufficient again to cover them over. She takes plenty of the proper kind of food, but the carbonates and phosphates are not assimilated. An examination showed that the urine was so loaded with the phosphates that it was calculated that 0.9168 grammes were eliminated in twenty-four hours. Thus, this child was excreting through the kidneys alone four times as much as would be normal to a person of thirty years of age. No carbonates were here found.

Case number three was that of a lawyer of forty-two. All his teeth were arrested in their development, with pits and grooves running across the anterior teeth, and clear around the bicuspids and first molars, and with general constrictions and irregularities of structure. These were supposed to be due to eruptive diseases during childhood. The sensitive places in the teeth cut like soft horn, or old cheese. The color was a dark brown, and no traces of a pulp chamber or root canal could be found.

Case number four was one that came under the observation of Dr. W. C. Barrett, and was presented before the Illinois State Dental Society, in 1882. The casts were made from impressions of the mouth of a young man of otherwise full development, with no marks of inherited or other disease, who comes of a generally sturdy race. The maxillæ were well developed, and the mouth presented a full and natural appearance, although no teeth were visible. There are absolutely no crowns to the teeth, their summits being upon a level with the gums. The only vestige of enamel was some nodules around the cervical edges. The gums were hard and unyielding, and no difficulty had been experienced in mastication. The color of the teeth was a rich, light amber. This condition had not been caused by attrition, as they had always been in this state, no crowns ever having been developed.

This seemed the result of heredity, the father having the same peculiar dentition. Dr. Barrett removed what were remaining in the mouth of the latter, and submitted some of them to a microscopical examination. They were of a dark, almost mahogany color, and there were no traces of root canals except near the apex. The dentine was not regular in its development. Few dentinal tubules remained, they seeming to be obliterated by a deposition of calcarious matter, but as the apex of the root was neared, the dentine was of a more regular character. The whole structure appeared originally to have been imperfect, with numbers of minute chambers, some of them appearing to communicate with abnormally large dentinal tubules. The apices of the roots were well formed, and contained pulp canals of nearly normal size.

The cementum was less in proportion than is usual, the dentine being invested by but a very thin layer, but what there was seemed normal in structure. The entire absence of enamel must have been due to a lack of an enamel organ, or to its functional inactivity.

There was a distinct heredity in the case, and the family history, as far as it could be determined, showed that one or more of the family in each generation possessed this peculiarity. But one of several children in this family showed it, and the peculiarity followed the rule of true heredity, appearing sometimes in a collateral branch and not at all in the line of direct descent.

The essayist believed these phenomena to be due to a lack of calcification, owing to defects in the assimilative function. Decay is rarely present. Dr. Barrett very aptly says, regarding the case that he reported, that there was no caries present. The secretion of the mouth in such cases is nearly always alkaline, and quantities of tartar are usually present. The teeth are always soft, and cut readily under the bur. The pulps recede, and in many cases the pulp chamber becomes entirely filled. The enamel, though nearly twice as dense as the dentine, wears away quite as readily.

There is, in such cases, usually no lack of a supply of the phosphates, but they are excreted and not properly assimilated. Frequently the child possesses a very active brain, and its development may rob the teeth of their nutrient materials. The essayist has endeavored to discover some effective method of treatment, but so far without success. General hygienic care should be taken as regards food and out-of-door exercise, in the hope that nutrition may be benefited, but he knows of no specific measures that will result in a cure.

DISCUSSION.

Dr. Barrett: The etiology of furrowed and pitted enamel has not yet been fully explained. The imperfections present such a variety of form, and the conditions are so widely variant, that nothing yet presented has, to my mind, met all the requirements. It has been urged that the congenitally furrowed enamel found usually in the incisors, cuspids and first permanent molars, is due to some of the exanthematous diseases encountered during the process of formation. But this does not seem probable, to my mind, for a number of reasons.

First, if this were a cause, it would probably be a constant cause. But it is the fact that while nearly all children are attacked by these diseases, but a few have the furrowed enamel, which, we are told, is consequent upon them.

Second, the furrows are transverse, while it is well known that enamel does not grow like a cornstalk, but is deposited over nearly the whole surface at the same time. Any interruption to nutrition should therefore mark the whole surface of the enamel.

Third, these diseases often spend their virulence at a time when the enamel has been practically completed upon the teeth that are affected.

Fourth, furrowed enamel has been found in children who have never been affected by the eruptive diseases.

I cannot, then, accept the theory that these conditions are due to this cause. It must be some defect in the enamel organ itself, perhaps due to disturbances in nutrition. The soft, horny, uncalcified teeth must be caused, as the essayist intimates, by a lack of assimilative power. It has been abundantly proved that it cannot be ascribed to a lack of phosphatic elements in the blood, for any food upon which either the pregnant woman or her offspring could subsist at all, must have enough to supply bones and teeth, provided nutrition and assimilation were perfect.

In the fourth case instanced by the essayist, and of which I have some personal knowledge, there must have been almost an entire failure of the enamel organ. This could not have been from the lack of proper food for the mother, because the circumstances and habits of the family forbid this assumption. There is, practically, in the case cited, not only absence of the enamel cap, but as well of the coronal dentine, which should be enclosed within it, leaving nothing but the root portion that was below the general level of the gums.

This was unmistakably a case of heredity, for not only did the father and one of his sons possess this characteristic, but it had, as far as I could learn, been persistent in the family as far back as this particular in their history was known, cropping out according to the true law of heredity, not always in the line of direct descent, but occasionally in a collateral branch of the family. Of course, this could not be definitely determined, because it had not been under the observation of an expert, who alone would give it the attention necessary to enable one to draw definite conclusions.

Dr. J. L. Gish: I had under my observation a child of seven years of age, everyone of the deciduous teeth being worn down even with the gum. The mother said that the teeth were imperfect when erupted. I watched the case for some years. The roots of the molars did not absorb in the usual manner, and the teeth were extracted to make room for their permanent successors. The anterior teeth were shed in the usual manner. The permanent teeth are normal and the present dentition perfect.

Dr. Fletcher asked Dr. Barrett how far back the peculiar dentition in the case cited by Dr. Talbot could be traced.

Dr. Barrett answered that no reliable statistics could be given, because, as stated, it had not been under the observation of any expert. It was merely a kind of family tradition that it had appeared in a number of generations, and how much further no one knew.

Dr. Allport: A case that illustrates the power of heredity occurs to me now. It was reported by me twenty years ago. It came into my hands forty years ago. Three generations were represented, the oldest being eighty years of age. Not only were the teeth peculiar in form, but even the hue, a bright slate color, had been handed down through the three generations. How much further it extended back I do not know.

DR. TALBOT: There is an aspect of these matters that is new to our literature, but to which much more attention should be devoted. It is that in which there is a great lack of assimilation of the carbonates and phosphates. A child of ten or twelve years becomes very nervous and irritable. She — for it is quite likely to be a girl — cannot sit still in school, and is constantly being punished for things beyond her control. She eats all proper foods, but is not well nourished, and has all sorts of nervous troubles. Perhaps she cannot control her urine. Examination reveals the fact that her saliva and urine are loaded down with the carbonates and phosphates for which her system is languishing. She gets plenty of the inorganic in her food, but it is regularly eliminated.

These conditions may be observed in pregnancy, only in this case the fœtus may use up some of them. Sometimes, when a bone of a pregnant woman is broken, it will not unite until after her delivery. The teeth decay remarkably quick. Perhaps one tooth will wear away very fast, while the one next it preserves its condition. Evidently some of the teeth are softened. Dr. Truman says that in erosion the tooth becomes harder. I find the opposite to be the case.

Regarding the treatment of these cases, we know absolutely nothing. Physicians order the patient a change of air, to get out of doors as much as possible and to live upon a generous diet. But this is only experimental. Sometimes there is a decided neurosis present, and the child becomes unusually precocious, and this is usually indicative of early death.

In gouty diathesis the teeth will begin to soften, but we do not absolutely know that there is any direct connection between the two. I am now just beginning a series of experiments looking toward a possible solution of these questions, and propose to follow them up as faithfully as possible.

On motion, the subject was passed.

A paper was presented by J. L. Gish, M. D., D. D. S., of Jackson, Mich., upon

DISEASES OF THE GUMS.

(The reporter regrets that he was unable to obtain an abstract of this paper.)

DISCUSSION.

DR. J. S. MARSHALL: The treatment of inflammation of the gums, as of other hyperæmic conditions, is often simplified by employing electricity. If the positive pole be placed over the hyperæmic tissue, and the negative at the base of the brain, the hyperæmic condition will be relieved, while a reversal of the poles will increase it. If there be incipient inflammation in a tooth pulp after filling, it may be resolved in this manner. The Faradic current will set in motion the blood corpuscles, and thus relieve the impending stasis. This should be done twice or thrice every day until relief comes.

A paper was read by Dr. W. C. Barrett, upon

THE CONDITION OF THE DENTINE IN PULPLESS TEETH.

(This paper, with the discussion upon it, is reserved until journalistic space is not at as high a premium as in this number.)

A paper by J. Smith Dodge, Jr., M. D., D. D. S., of New York, was read, entitled

THE GENERAL AND LOCAL IN PATHOLOGY.

Ignorant minds, said the essayist, necessarily look to the seat of pain, or other disturbance, as containing the disease. In our time the cellular pathology of Virchow has given a strong impulse toward more local conception, and bacteriology seemed for a while about to convert all pathology into the local action of microbes. But the opinion grows that it is not so much the bacteria as their ptomaines, diffused by the hæmatic and lymphatic circulations, which cause disease.

Dental pathology is so recent that it can hardly be said to have shared all these fluctuations. The early modern dentists were first of all physicians, and they naturally viewed all affections of the teeth, not of mechanical origin, as symptoms of a general disorder. But a change resulted from the labors of Harris and his compeers in the cause of dental education. Formerly, it was the opinion of careful men that the manual skill and practical usefulness of a dentist was in inverse ratio to his scientific attainments.

This resulted from the differences between those who would treat dentistry as a branch of medicine, and those who believed it essentially mechanical. But now, the intimate relations existing between the teeth and other parts of the system is recognized by all, while the mechanical skill required to restore the loss by ravages of disease is appreciated on all sides.

There can be no doubt that the structure of the teeth partakes of the general condition of the system during the formative stage. This is a little obscured by the fact that the condition of tooth tissues, when once formed, does not fluctuate like most of the others, but during the formative period they are as easily influenced as other organs. But this does not comprise the whole of the pathology of tooth substance. Many observers have proved that a slow circulation pervades the dentine, maintaining a correspondingly slow process of renewal and interstitial growth. The evidence of this is not easy to disentangle, yet we know that the teeth rapidly decay during, or immediately after, some attack of prostrating sickness.

It is now determined that, except at the beginning, caries depends very little upon external conditions, and therefore the decay that succeeds sickness and pregnancy must exist within the tooth. New deposits of lime salts within the dentine, in zones surrounding decay, must mean a heightened vital activity, which must be traced back to nerve centers. From these, and other considerations, it would seem that tooth decay is not solely a local matter.

Another change in pathological knowledge is indicated by our conception of pyorrhœa. Once, every such manifestation was attributed to tartar or calcareous deposits. Now we recognize a general pathological condition.

Odontalgia, also, is now proved to be sometimes the local manifestation of a general disturbance. Usually this is of a reflex nervous character, but there are instances in which it is indicative of structural changes.

It requires no violent stretch of the imagination to picture the dentist of the future, as commencing his examination of a case by careful inquiry into the heredity and the constitutional state of the patient, as well as into local conditions, using the stethoscope and the sphygmograph in examination, as well as the mouth mirror and the probe.

M. H. Fletcher, M. D., D. D. S., of Cincinnati, presented a paper entitled

A Universal Mento-Dental Splint, with Report of a Case.

The splint which, as the title of the paper indicates, is intended for fractures of the inferior jaw, consists of an upper and lower impression tray, the former to rest under the chin and the latter in the mouth, and connected by guide-pins and a screw, which may be a simple iron one, like those sold by the gross in hardware stores. They are attached together in relatively the same positions and upon the same principle as the parts of the Lewis Duct Compressor, which is employed to hold a mouth napkin in position under the tongue.

Finding that the tray under the chin caused abscesses by its chafing, notwithstanding the padding used, Dr. Fletcher has substituted for that a forked wire, wide enough to pass outside the chin, and to which a canvas stretcher is attached, so that the pressure will be more evenly distributed. Such a device presents many advantages.

The case presented, casts of which were shown, was a comminuted and compound fracture of the lower maxillary, running obliquely from the left cuspid to a point beneath the right cuspid. A quarter of an inch of the bone was lost, because of the comminution. The results obtained by the use of the splint were excellent. The affair was complicated by the fact that a hospital surgeon had attempted treatment of the case by means of bandaging alone. But the results to be attained were so unpromising, that twelve days after the accident the adhesions were broken up, and Dr. Fletcher's splint adjusted with the happiest consequences.

DISCUSSION.

Dr. **MARSHALL**: It seems to me that a better way to treat these cases would be by wiring, as they are so much easier to keep clean. I dissect down the tissues until I reach the edges of the fractured bone. Sometimes these are reached by an incision from the outside, the tissues and the periosteum being laid back. A drill is then passed through, near the ends of the bone, being careful to avoid the roots of the teeth and the inferior dental canal. A heavy silver wire is then passed through the holes in each end of the bone, and the parts are drawn together. Two or more of these sutures are made and secured, until the fractured parts are immovable. I have treated fractures in this way, without any bandaging, a great many times. The only after-treatment consisted in frequent irrigations with Thiersch's solution (as given on page 160).

Dr. Marshall related a case in which, in an emergency, he found himself without the necessary facilities for proper wiring, and in which extension was essential. He found two screw-eyes, such as are used in picture frames, for suspending them. One of these was firmly inserted in each end of the fractured jaw, and by their means it was worked into place. A piece of a cigar box was then whittled out to the right length to keep up the extension, and it was placed between the two screws, close to the jaw. Ligatures were then passed from one screw to the other, and properly crossed until the whole was firm, and this formed the entire apparatus used. The occlusion was perfect when the case was completed.

In another case he tied ligatures around the upper and lower molars, and also around the bicuspids, and thus bound them all together, upon the same principle employed by Dr. Angle, in his bands and pipes used for this purpose.

As regards the time for removing the wires, that must depend upon circumstances. In nearly all the cases suppuration will ensue, and perhaps retard the knitting of the bone. He usually leaves them in from four to eight weeks.

Dr. **ALLPORT**: The splint presented by Dr. Fletcher is new, and offers some important advantages, but I am of the opinion that few cases cannot better be handled by wiring, than in any other way. So far as I know, I was the first to use this, thirty years ago. I once treated a case in which each jaw was broken into four pieces, making eight in all, and excellent results were secured by wiring alone.

Dr. BARRETT: A case was presented to me of a boy about twelve years of age, over whose head the wheel of a very heavily loaded wagon had passed, fracturing the lower jaw in a number of places. The boy was brought to the city from fifty miles away, and taken to a well-known and skillful surgeon, who wired the pieces together by wires around the teeth. But when the boy attempted to close his mouth, the jaw went away around to one side, the symphisis being nearly an inch deflected. I was sent for, and found four physicians present, and all said they were not ashamed to admit that the matter was beyond their knowledge or skill. Hence they had called upon a specialist in these things. The boy had been under an anæsthetic the most of the time for four hours.

Reasoning by exclusion, as I found no crepitation and no fixation, I came to the conclusion that there was no luxation, and no complete fractures that were not securely wired. That left but one cause for the condition — an incomplete, or green-stick fracture, across the angle of the ramus. With the muscles relaxed the jaw fell directly down, but when he attempted to close his mouth, the temporal, and internal pterygoid, with some of the fibres of the masseter, not being counteracted on the other side, drew the jaw to one side, it bending or yielding at the point of the incomplete fracture.

The boy was taken to my office, and gutta-percha impressions taken of both jaws. These were trimmed to the proper shape, and a notch cut in front for feeding purposes. The boy was then again anæsthetized, the occluding surfaces of the gutta-percha impressions that were to serve as splints warmed until they were adhesive, and then by main force the jaw was carried to its proper place and the two gutta-percha splints stuck together, when the whole was fastened with a two-tailed bandage. The results were all that could be desired.

Dr. FLETCHER: In the case cited by me, wiring was inadmissible, because a quarter of an inch had been lost by the comminution.

John S. Marshall, M. D., of Chicago presented a paper entitled

A PLEA FOR EXTRACTION AND REPLANTATION AS A MEANS OF CURE IN OBSTINATE ALVEOLAR ABSCESS.

The essayist claimed no new discovery, nor, indeed, any specially new method of procedure in an old one. In these days of antiseptic surgery, many things are accomplished which a few years ago would have been thought impossible. The abdominal cavity is opened with impunity and startling operations performed upon the enclosed viscera. The thoracic cavity is explored and portions of the lung removed. The cranium is perforated and tumors extracted from the brain, and the patients live to tell the tale. Teeth are implanted in long edentulous jaws, and for a time, at least, seem to thrive.

The essayist was led to the adoption of the practice of extraction and replantation, because of the failure, both by himself and others, to cure a considerable percentage of cases by the ordinary means at our disposal. This form of alveolar abscess is usually the result of a crooked root, or an abnormally small canal, or of perforation of the root in attempts to open small canals, or erosion of the apical end of the root, or the presence of broaches, filling materials, or dressings which have passed the apical foramen. There may be a discharge of pus more or less constant, or there may be a chronic induration of the tissues, with alveolitis. Such teeth are usually condemned to the forceps, but it is the belief of the essayist that by extraction and replantation a majority of them may be saved.

In cases of tortuous or narrow roots, it is impossible in the mouth to tell when they are perfectly filled. If the roots are eroded, or have upon them deposits, it is equally impracticable to put them in good condition without extraction, and sometimes broaches become so wedged in the narrow canals that it is impossible to remove them, when broken off, by any other method. With the root in the hand it can be minutely inspected, and any imperfection, malformation or accidental injury remedied.

The extraction and replantation of a tooth under such circumstances is as much founded upon physiological law as bone or skin grafting, and no one condemns these. Union with the tissues with which they are placed in contact is the result of the same vital process, and success is as certain in the one as in the other, provided the same aseptic and surgical conditions are observed.

Failure in cases of replantation is much more rare than in implantation. When it does take place, it is usually because of the resorption by the osteoclasts, after attachment has taken place. There is very seldom any lack of plastic exudate to form the union.

There are certain individuals for whom it would not be wise to undertake this operation, such as those suffering from general anæmia, tuberculosis, and syphilis. Such people are never good subjects for surgical operations.

Of the many such operations that I have performed, ranging in standing from a few months to fifteen years, I have not yet, so far as I know, to record one failure.

The after treatment consists in frequent irrigation of the mouth with antiseptic solutions, among the best of which are the Thiersch solution, composed of

Boric acid,	12 parts.
Salicylic acid,	4 parts.
Water,	1,000 parts.

And one consisting of

Listerine,	1 part.
Water,	3 parts.

Bichloride of mercury preparations are not permissible, because of danger from poisoning, and the liability to blacken the teeth.

The method of union is perhaps of interest. I believe it to be a kind of bony anchylosis, where the pericementum has been destroyed or the cement tissues partially removed, and I can see no reason why under these conditions union may not be as perfect as in the case of a fractured bone.

The following points would seem essential to success:

First, exclude anæmic, tubercular and syphilitic cases.

Second, secure thorough aseptic conditions.

Third, remove eroded surfaces and all depositions.

Fourth, hermetically seal the pulp canal.

Fifth, curette the abscess cavity and wash it out with an antiseptic solution.

Sixth, secure entire immobility of the replanted tooth until union has taken place.

DISCUSSION.

Dr. Barrett: I have followed the practice recommended in the paper for a considerable number of years. But lately, a lady presented herself with an abscessed lateral incisor, who had been under the care of a physician for some time, until there were indications of a necrosed condition. The tooth could easily have been extracted with the fingers. At the earnest entreaty of the patient an attempt was made to save it. When the inflammation was so far subdued that the pulp canal could be entered, a broach was unfortunately broken off in it, and all attempts to remove it were in vain. The tooth was extracted, and after proper perparation and filling was returned. But, as a result of the violent ostitis, a deep chamber was found in the jaw above the apical position, that allowed the tooth to enter until the cutting edge was level with the gums. It was finally ligated in its proper place, and is to-day as firm and apparently as healthy as any of the other teeth, though some spiculæ of necrosed bone were removed two weeks after the replanting.

The time having arrived for adjournment, the subject was passed.

THE DENTAL PRACTITIONER
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DR. W. C. BARRETT, ... EDITOR.

BUFFALO, N. Y., JULY, 1892.

ROOT CANALS.

If any dentist will go to the box which contains the teeth that he has extracted, and will make a careful study of their contours, he will at once see that there is a wide difference in the conformation of the crowns, and that the pulp chambers present as great a diversity in shape and size. He may also discover another fact, and that is that the entrance to the root canals is from all points of the compass, and presents all the modifications from a great round hole to the narrowest slit imaginable, while the canals themselves will be found ramifying in almost all directions. And yet, many seem to act upon the impression that all that is necessary to prepare a root for filling, is with a bur or drill to sink a shaft straight down into the tooth almost anywhere, and in some way it will find the root canal.

Of course, these remarks are mainly applicable to attempts made in bicuspids and molars, but to some extent it is true of the anterior teeth. It is very easy in attempting to drill out the canal of an incisor, or in enlarging it for the insertion of a pivot, to break through somewhere at the side. It is not always possible to determine by external appearances in just what direction a root extends. There may be a deflection just at the cervical portion, and the crown may be set at an angle to the axis. Sometimes, too, the root is not straight, but at a point between the crown and apex there is a curvature. Nor can this always be determined by probing with a flexible broach. Extreme care is, therefore, often necessary, in any attempt at enlargement of the canals, even in front teeth.

But if this be the case with single roots, what shall be said of irregular shaped bicuspids and molars? Sometimes in the latter the crown is exceedingly short, and the pulp chamber shallow, so that opening or enlargement of the latter with a bur is done at the peril of breaking into the septum between the roots. This, of course, is usually fatal to any attempt at their proper treatment and filling. Every effort to reach the canals is attended with the liability to enter the opening to the pericementum and alveolus, with the consequent influx of blood and serum, and the probability of the formation of a new point of infection.

The palatal root of a superior molar usually approaches in shape that of an incisor, and the canal is almost as readily found and entered. But occasionally it seems to be at one cornua of the pulp, and again nearer the other, and it requires considerable patient search before it can be exactly located. An engine bur is a very poor instrument to look for it with, because it gives no intimation of the fact when it is found, while it is quite likely to go just where it is not wanted.

The posterior buccal root is yet more difficult to locate, and when found is hard to penetrate, while not infrequently it is absolutely impossible to thrust the finest broach for any distance into the anterior buccal root, or to enlarge it without extreme danger of opening through it at the sides. Sometimes the opening to the posterior root seems on a line with that of the palatal, and again it is the anterior one. Occasionally they all seem to diverge from near the same point, and unfortunately the contour of the crown gives little indication of what is the exact condition.

In lower molars, the posterior canal is usually easily located, but it is hard to determine its shape. The root may be wide and flat, with a thin, constricted portion in the center, and there may be an opening into each thickened border, while the central portion may be almost or entirely closed. Only the most careful examination will determine what is the exact condition.

The pulp canal of the anterior root of lower molars is the most aggravating of all. If, as is frequently the case, the cavity of decay is upon the posterior border of the crown, it is almost impossible, without cutting nearly through the tooth, to find the narrow slit that is too often all there is of it. The root, too, is frequently curved and very thin, while what of opening there is seems to exist at the very anterior edge of the crown. It is usually quite impossible to clean out such a root, and dependence can only be placed upon sloughing of the contents, the thorough asepticising of the canal by absorption of the medicament, and the final filling of it as well as one can, with a thin, plastic material. This method, of course, means treatment for a greater or less period of time.

Inferior bicuspids usually have but a single canal to fill, although this may be a wide but thin slit. There is commonly little difficulty in locating it, although the first bicuspid is more apt to give trouble than the second.

Superior bicuspids are more easily reached than the molars. The first sometimes has two canal openings, that may be readily entered, while in other cases there seems to be but one. The pulp chamber, too, is at times irregular in shape, the canals tortuous and with constricted portions. Not infrequently such a narrowing will be found about three-fourths of the way up, having passed which there seems to be a kind of enlargement between that point and the apex, which it is extremely difficult thoroughly to clean out, or successfully to fill. Yet the continued success of the operation very largely depends upon perfect work at this point.

Complete access to any root canal depends upon getting the mouth of it well open. If the entrance is at an angle to the axis of the root, there will be an overhanging edge of dentine, partially blocking the opening, and if the inclination points forward this ledge must be removed before any thorough work can be done. It is just at this point that the danger arises, especially in molars, for if the root be thin, there is danger of perforating it. In many lower molars the septum of bone is thick, the bifurcation extends well up to the crown, and but a very thin layer of dentine and cementum separates the pulp chamber from this bony septum between the roots.

If a bur be used to remove the dentine at such canal openings, there is great danger that it will penetrate through and the tooth be ruined. Even though the pericementum be not reached, if the cementum be injured serious consequences may ensue. It should be remembered that this is living tissue, and is in relation with the pericementum. It cannot be devitalized like the dentine, without the loss of the tooth. Irritation of the cementum corpuscles may extend to the investing membrane, and thus induce a pericementitis that will make extraction necessary. There is little doubt that many teeth have thus been lost through injury to the cementum, when the exact cause could not be determined.

From all these considerations, then, we deduce the conclusion that a bur is a very dangerous thing to introduce into a pulp chamber. If it be necessary to enlarge the opening into a canal, the excavator is the only safe instrument, for it is comparatively easy to know what progress has been made with it, and the advance is slower. The bur buries itself in its own debris, so that its exact position cannot be definitely determined, while the tremulousness of the handpiece is fatal to all delicacy of touch.

But with the greatest care in searching for root canals, and with the utmost pains in the attempt to enter them, there will still remain a percentage that must remain unfilled. They are so minute, perhaps, that the most delicate instruments cannot be introduced, or they are so tortuous that it is impossible to follow them to the apex. If sufficient time be given for the sloughing of their contents, and if antiseptics be allowed to remain until they shall have thoroughly penetrated them by absorption, they may, probably, safely be left to nature's care. But if one would know how best to obtain access to root canals, he must do what we urged at the commencement of this article—study well the forms of extracted teeth.

PROFESSIONAL AFFAIRS IN GREAT BRITAIN.

In England, the register of dentists is kept by the Medical Council, and the government of the profession practically rests with medical men. Some way, the idea does not obtain there that reputable dentistry has nothing to do with medicine. To obtain a place upon this register, the applicant must possess the necessary certificate, granted by a competent examining board. Some of these require that the student or applicant shall sign an agreement that, in case he subsequently attempts to attract business by public advertising, or shall indulge in any practices considered by the examining board unbecoming to a professional man, the diploma shall be cancelled.

One H. F. Partridge graduated from the Royal College of Surgeons, Dublin, Ireland, and before receiving his diploma signed this agreement. Under this diploma he was admitted to the dentist's register by the Medical Council, and commenced practice in London. He soon began to advertise very widely, and upon the attention of the Medical Council being called to it, his name was stricken from the list, under a clause of the enabling act which provides that the General Medical Council may erase a name from the register on proof of infamous or disgraceful conduct in a professional respect. Different legal measures were adopted by Partridge, with varying results, until finally the case came before the Court of Appeal, upon a petition to have his name restored to the register, with damages for malicious prosecution.

The appeal was dismissed, and Mr. Partridge is, therefore, and must remain, disqualified for the practice of dentistry. But in the course of the trial, as reported in *The British Journal of Dental Science*, a number of points were made, and decisions given that are instructive to American dentists. It must be remembered that in England vested privileges are more closely guarded than with us. Public sentiment, too, sustains many things that would be condemned here. To be a member of a profession there conveys with it certain privileges unknown in America. The presiding judge, in the course of the trial, said:

> "The plaintiff had, on obtaining his diploma in Ireland, promised not to advertise while holding that diploma. That body considered that they should act fairly by each other, and ought not to advertise. Just as in our profession, where all are rivals against each other, a barrister is not allowed to advertise his superior talents, or that he will do his advocacy cheaper. I think if he did so, I should consider it such disgraceful conduct that he ought to be immediately disbarred. No one need become a member of the dental profession unless he desires it. I say the authorities—this medical tribunal—have a right to determine, if it is within reason, whether the conduct is or is not disgraceful professional conduct."

When the counsel for Mr. Partridge came to address the Court, he argued that such powers as were granted the Medical Council should be carefully watched, and that his client had his name stricken from the role from insufficient cause. One of the judges here interrupted him with the inquiry: "Would it not be disgraceful conduct for a barrister to advertise?" The counsel answered, that notices in the papers are often seen that a barrister had joined some particular circuit (lawyers there follow the judges from one place to another in the "circuit" in which court is held, picking up cases at each one), and this conduct is very like advertising. This assertion was taken in high dudgeon by the judges sitting in the case, each of whom commented upon it rather severely. They believed that the counsel was mistaken, but if it were true it should be brought to the attention of the Inns of Court, and if any lawyer was found guilty the Benchers would certainly mete out merited punishment.

This jealousy of the good name of the profession is certainly commendable, and it is a pity that there is not more of it in this country. It is a common thing for the newspapers here to publish the names of lawyers with, perhaps, commendatory comments, in important cases. Surgeons, also, who perform capital operations, are often the subject of newspaper notices. This, perhaps, may be entirely legitimate, and the thing may be done without the procurement or knowledge of the surgeon, or physician, or lawyer. But it is also undoubtedly the fact that the ordinary professional man, who has charge of some simple case, may through the complaisance or credulity of a newspaper reporter get a newspaper puff for which he is directly and solely responsible, it being either written or inspired by him. We have seen all the particulars of the removal of a simple benign foreign growth, that a barber could safely and easily cut off with his razor, magnified into a capital operation, and technical terms used that could only have come from the doctor himself.

Such things as these are, of course, highly disgraceful to any professional man. But they are too common to excite comment in some localities. It is to be hoped that when professional lines are drawn as they should be, and professional men become actuated by a true professional spirit, they will be looked upon in the right light. But that day will not be hastened by ridiculing the professional tendencies and aspirations which should be cultivated, or by endeavoring to foster the idea that dentistry is a mere mechanical trade, having no affiliations with medicine, or any right to a professional code of ethics. In England it is seen that it is most distinctly recognized as a profession, and its immunities and privileges are sustained and guarded by the courts of law. As advertising is considered disgraceful and unprofessional in law and medicine, the court has decided that it is equally so in dentistry, and hence this forms a legal determination of its status in Great Britain. It is a profession, and all qualified practitioners are entitled to the consideration granted professional men. But they must not indulge in advertising, upon pain of withdrawal of all professional recognition, and if the graduate of any school signs an agreement to abstain from unprofessional acts, his diploma may be cancelled, and his authority to practice dentistry be revoked if he transgresses.

NEW YORK STATE DENTAL SOCIETY.

The twenty-fourth annual meeting of the Dental Society of the State of New York was one of the best in its history. The President, Dr. W. W. Walker, had determined at the beginning of the year upon a definite line of action. First, there were to be no clinics, and no exhibition of dental goods in or about the place of meeting. Thus, one of the most potent factors in the distraction of the minds of the members from the legitimate work of such a meeting would be eliminated. Second, there should be some papers presented that were worthy the attention of members. This was accomplished by inviting none but men of ideas, men who really had something to say, to present the subjects for thought and debate. In this the President was eminently successful. Third, the men who should take part in the discussions were to be selected in advance of the meeting, and thus given an opportunity to prepare themselves for the work in hand.

But all these good resolutions would have availed naught, had not good judgment been shown in the selection of the men. It is not usually those who are most ready and anxious to join in the discussions who should be called upon. Very often the men who are most ignorant are the ones who most desire to take the time of a society, while those really competent to instruct do not rise unless specially called upon. If, in a large society, like the usual State organizations, there is no check upon the vaporings of those who occupy the time from mere personal vanity and desire to display themselves, the debate becomes trivial and not worthy the attention of thinking men, while the attendance soon falls off, for members do not travel long distances to listen to mere inanities. If they are not instructed, they find the meetings too unprofitable to be worth the time and expense involved.

So, judgment must be exercised, not only in selecting essayists, but in determining upon the speakers. The last meeting of the New York State Society was, we think, a revelation to many in this respect. It was always kept well in hand by the President, and very little time was wasted.

Dr. Walker's annual address was mainly historical and advisory. The first paper upon the programme was by Prof. Edwin T. Darby, of Philadelphia, upon "Dental Erosion." This is a subject that has not received the attention that it deserves, and its announcement aroused a great deal of interest. The essayist believes that the erosion which may be found upon the various surfaces of the teeth, is not necessarily due to the action of the brush, nor to the use of harsh tooth powders. He thinks that, usually, at least, it is connected with and more or less dependent upon the gouty diathesis. In some instances which he cited, erosion commenced and made considerable progress before either gout or rheumatism showed themselves, but the tendency existed, and sooner or later manifested itself. Prof. Darby certainly made an ingenious argument, and even those who at first believed that there was little or nothing in the theory, soon learned to treat it with great respect.

It seemed to be generally admitted that true erosion must be due to some degenerated or depraved condition of the oral fluids, probably that of the mucus follicles, in special localities, and that this might be brought about by some constitutional predisposition. It is well known that the podagrous diathesis induces certain depositions of chalky matter, and, as well, that it sometimes causes resorptions. Hence it was quite possible that it might be associated with tooth erosions. But all were not ready to admit that in all, or even a majority of the cases, any connection between rheumatism and erosion could be directly traced.

Dr. E. S. Talbot presented another of his very instructive papers upon different methods of treating irregularities of teeth. Dr. Talbot has established an enviable reputation for breadth of intelligence and general comprehension of the principles which underlie aberrations in the arrangement of teeth. His paper was general in its scope, being a kind of retrospect of the whole subject, and introducing no specially new principles. He called attention to the necessity for careful study of a case before deciding upon methods for its treatment, and related instances in which measures to retract the teeth of one jaw had been instituted, when the whole abnormality was in the other, and due to arrested development.

Dr. C. F. W. Bödecker brought Dr. Wilhelm Herbst again to the front. It is some time since Dr. Bödecker has presented a paper for the consideration of dentists. His views are always so original, and withal are urged with so much of ability and zeal, that it may be believed that the mere announcement of his name raised expectation to a high pitch. The subject matter of the paper read at Albany, "The Herbst Method of Treating Exposed Pulps," was entirely new, and it was so diametrically opposed to the usually received theories that it caused some astonishment. The method, in brief, is, when a pulp is exposed, it is treated with cocaine until anæsthetized, when a sharp bur, as near in size to the bulbous portion of the pulp as possible, is placed in the engine and the coronal pulp removed. Then, without further treatment, tin is burnished down over that portion remaining in the root canals, and the cavity is filled. Antiseptics are not employed. Of course this is the treatment for teeth having living pulps which it is necessary to remove.

Dr. Bödecker said that he had condemned this method as bitterly as any one well could, and had warned Herbst that it was against all the usual methods of practice; but he had for years been so importuned by him to try it that he finally did so, with results that had been as astonishing to him as they could be to anybody.

He presented drawings and descriptions of microscopical preparations made from teeth so treated for experimental purposes, and finally extracted, in some of which the pulp in the roots had remained alive. The paper was received with some marks of incredulity, but coming from such a source there was a disposition to give it fair treatment. Had it been presented by some less capable observer, it would scarcely have been listened to with patience.

Dr. A. C. Westlake exhibited his electric apparatus for dental practice. It was very neat, and seemingly perfect in its working qualities. His remarks were mostly explanatory of it. There is not sufficient comprehension of the laws which govern the evolution and direction of electricity upon the part of the average dentist, to enable him thoroughly to comprehend some of the intricacies and technicalities employed; but all were very deeply interested, and great admiration was expressed for the ingeniously contrived machine. The constantly increasing number of uses which dentists make of electricity was alluded to, and the prediction made that within a few years its employment will be as common as that of the dental engine. If dentists are to assume the charge of a large class of ailments that properly fall within their province, and intelligently treat cases of facial paralysis, with many other disorders that now are usually referred to the general practitioner in medicine, they must become familiar with the various currents which are used in medical practice.

Among the reports presented, that of Dr. R. Ottolengui, upon "Practice," was the most notable. He had formulated certain questions that were sent to many leading dentists, and the answers were collated and tabulated so as to give an idea of what was the method which prevailed among the most intelligent practitioners. The report when presented will be very instructive. It is impossible to give an idea of it within the narrow limits of so brief a review as is this.

The officers of the past year were re-elected. Next year will be the quarter centennial of the Society, when it is proposed to hold a memorial meeting, with some special features.

THE AMERICAN MEDICAL ASSOCIATION.

The forty-fourth meeting of this Society was one of the largest in its history. In the most of the sections there is very little of discussion, for the number of papers presented is so large that little besides their mere reading can be attended to, while many must be read only by title. The Section of Surgery, for instance, had forty-two papers; Obstetrics, forty; Neurology, forty-one; Ophthalmology, forty-six; Laryngology, forty-seven; while Dental and Oral Surgery had but twelve. All these were exclusive of the addresses at the general sessions, which were held daily.

The dental section comprised only a comparatively few men, but every one present was there for business. There were no displays of goods, and no visitors from curiosity. There was no machinery to run, and no professional politics. There were few offices to fill, and such as did exist were of little importance. There were no wires to pull, and so, of course, no wire-pullers. There was no professional patronage, and, therefore, no scramble for position. A committee was appointed to nominate officers, and they nominated themselves—at least a majority of them; but no one cared, for the offices were not worth contention, and there were very few who felt any desire for official place. If there were any who were covetous of those things they were quite welcome to them.

This was rather a new revelation to those who were old habitués of society meetings, and who had so often witnessed a more or less disreputable contest for official place extending through the whole meeting; but the discussions were very earnest, although at times informal. There was a disposition to debate basal principles, while "incidents of practice," and long personal narratives, including the genealogy of patients, who invariably occupy some distinguished position, were notably lacking. There was usually a breadth of view in considering a subject, that indicated thought and reflection. Not that prejudice did not sometimes exhibit itself, or that old straw was not at times threshed again, as in the consideration of the hackneyed amalgam question. There was, in no instance, any violation of the amenities of debate, but the utmost courtesy prevailed at all times. What might have been the case had there been two hundred present cannot be told, but certainly the good feeling exhibited was commendable.

The dentists usually attended the general sessions, and seemed interested in general medical science. A number of them read papers in other sections, and, of course, met with precisely the same consideration that other members did. There was no more thought, apparently, of any inferiority or secondary consequence of the dentists, than of ophthalmologists or dermatologists. All were equally members of the American Medical Association, of the same relative importance, and there was no assumption of superiority on the part of any section. There was a full representation of the section of Dental and Oral Surgery upon the general committees, and the members had as much consideration as any one. This much is said for those who foolishly fancy themselves constantly undervalued and snubbed, when among medical men, because they are dentists.

There are comparatively few in our specialty who have ever attended a meeting of the Medical Association, and it is because of this, and that dentists might have some comprehension of what it was like, and what the work of the dental section is, that we have prepared this brief sketch of the meeting, and in this number give an abstract of the principal papers, with a report of the discussions, so condensed, however, as to comprise the whole within a single number.

THE COLUMBIAN CONGRESS.

Just after the last form of the last number of this journal had gone to press, we received from the secretary of the executive committee of the Chicago meeting a list of the various committees appointed to date. These have been published by most of our contemporaries, and as our space is limited we will not at this late day print them again.

The meeting will be held from the 7th to the 17th of August, 1893, in Chicago. As every dentist knows, an executive committee, made up of fifteen of the best men in dentistry, has been at work for a year in its organization, with the full determination to make this the greatest dental meeting ever held. There is little doubt that it will be the largest in point of numbers, but that does not make a great meeting, and if the organizers were to stop at that point the congress might very easily be a colossal failure. But no one will be satisfied with a *big* meeting. There is a determination to make of it a *good* meeting as well. The best writers will be invited to present essays, and it is hoped that the discussions will be worthy the subjects. The Congress of 1893 must and will, no doubt, present something worthy the occasion. It should mark an era in dental progress, and not be handed down to history as a great professional circus. The meeting having been determined upon by entirely competent authority, it only remains for all to unite in making it as creditable to American dentistry as possible. He who refuses to do what he can is disloyal to the best interests of his profession. America claims to lead in practical professional work. This assumption must be fully sustained at Chicago in 1893.

We shall be glad to publish anything concerning it that is of general interest, and that reaches us in time so that it can be presented before it becomes out of date.

THE BRITISH DENTAL ASSOCIATION.

The next meeting of this Society will be held in Birmingham, and the managers are preparing an exhibition that, if properly conducted, will be of great interest to the studious dentist, and one that might well be copied in this country in connection with the meeting of the American Dental Association. Every member is invited to forward casts of dentures illustrating the effects of the extraction of the first permanent molars. These are to be arranged by the museum committee, and placed on exhibition during the meeting. Labels carrying the name and address of the sender will be attached, and after the close of the meeting all will be securely packed and returned to their owners.

At first thought, it might be imagined that such a display would be intended to establish some particular theory regarding the practice of the early extraction of the first permanent molars. It is well known that there is a wide divergence of opinion concening this method, some urging that thereby the salvation of the other teeth is assured; that the one in question is inherently weak and prone to decay, and that as it must so often be lost before middle age is reached, the denture, as a whole, is improved by removing it sufficiently early for the other molars to move forward enough to fill up the vacant space.

Others are quite as firm in the belief that the first molar, with proper care, may be as long preserved as the other teeth; that as it is the largest and most important tooth of the arch, its early extraction must result in a disarrangement of the dentition, the posterior molars, even if they do move forward, simply doing so by inclination, the apices of their roots remaining stationary, and that thus they present but an angle instead of a broad surface for mastication. Both sides are firm in their faith, and both present cases, which are not probably average ones, in support of their theories.

The invitation to present casts illustrative of the extraction of these teeth will probably be responded to by the adherents of both practices, and if a large number are thus got together an average may easily be struck. Or if not, the good and the evil resulting being both placed before the eye of the observer, he will be enabled to determine which predominates, and can be guided in his practice thereby.

But to make such an exhibition serve its best purposes, every cast exhibited should be accompanied by certain information. The age at which the tooth was extracted should be correctly given, and that at which the impression for the cast was taken. The change will be materially modified by the dental development when the operation was performed, as well as by the time intervening between that and the taking of the impression. The amount of care bestowed upon the teeth, the number filled, with the general condition of the oral cavity, may very materially modify the result, also. But all these points being given, such an exhibition can be made exceedingly instructive. The importance of these statistics does not seem to be sufficiently dwelt upon by the museum committee of the British Dental Association, if we may judge by their invitations. No cast should be received that is not accompanied by full information. If this be not insisted upon, we fear that such unscientific work as the mere showing of a great collection of unclassified casts may be more misleading than instructive.

Some time since, Dr. I. B. Davenport, of Paris, sent to the Odontological Society of New York a paper upon the evil effects of extraction of the first permanent molars, and this was accompanied by a collection of casts illustrative of the views of the author. The subject attracted earnest attention, and it was then hoped that it might not end there, but that other papers in support of or opposition to Dr. Davenport's belief might follow. So far this expectation has not been realized. We shall watch for the outcome of the exhibition of the British Dental Association with much interest, and if the results are, as we anticipate, rather disappointing, we shall hope to see it supplemented by some better organized and more scientifically conducted efforts of the kind in this country.

Dr. Davenport has promised to send to Birmingham his collection of casts, and these certainly will admirably illustrate his own views.

BOOK NOTICES.

The book notices and reviews in many of the medical, and a few of our dental journals, are little less than a fraud. Subscribers have a right to look to the journal for which they have paid, for a candid and intelligent opinion upon any new work issued, that they may learn whether it is worthy their attention. But some editors seem to exercise no discrimination whatever. Either they write notices without having read the books they pretend to review, or they are incompetent to form an intelligent opinion.

This has been amply illustrated in the case of a volume lately issued. It sells for less than a dollar, yet it was apparently quite sufficient to influence a number of editors. A cursory examination of the contents shows that it was written by a man who is densely ignorant of subjects upon which he sets himself up as a teacher. The most absurd errors may be found on almost every page. Here, for instance, is a question and answer found under the head of chemistry:

Question — What acids are the most destructive to tooth structure?
Answer — Nitric, sulphuric, hydrochloric and lactic acids.

The chemist who in this day and age teaches that mineral acids are those most destructive to the teeth, or the professed critic who approves such utterances, deserves to be held up to the censure of the world.

There are many other very palpable errors in the book. It is full of crudities of all kinds, and is utterly unfit to be submitted as a guide to students. And yet a number of our exchanges have unhesitatingly commended it to their readers. Nor is this the only bad book which has thus been approved. Look at the book notices in a large proportion of medical journals, and it will be apparent that they are written, either without consideration or without knowledge. If a book is sent the editor, he feels bound to commend it, sometimes in absurdly extravagant terms.

Now, this is all wrong. The interest of the readers and subscribers to a journal are those to be first considered. A book should never be written up until it has been examined, and then the plain truth should be told of it, no matter whether it pleases the advertising publisher or not. At any rate, that is the course which this journal will endeavor to follow.

SOME POINTS IN THE STRUCTURE AND DEVELOPMENT OF DENTINE.

J. Howard Mummery, M. R. C. S., L. D. S., of London, England, has contributed to the Philosophical Transactions of the Royal Society of London, a remarkable paper, having the above title.

It was presented by C. S. Tomes, F. R. S., and has received his approval. It antagonizes some of the usually accepted views of histologists, and affords much food for serious thought.

Mr. Mummery is the president of the Odontological Society of Great Britain, a careful, keen observer, and an indefatigable student, while he possesses, in a high degree, those accomplishments so necessary to a histologist, manipulative ability in the handling of a microscope, the preparation of microscopical sections, and the art of photo-micrography. At the Berlin congress of 1890, his paper and the lantern illustrations of it attracted universal attention.

The paper presented to the Royal Society reviews the theories as to the development of dentine, held by Tomes, Waldeyer, Hunter, Raschkow, Schwann, Kölliker, Baume, Klein, Weil, Charles Tomes, and others, and then proceeds to detail his own observations, which have extended over a considerable period of time. He takes issue with the theory of Tomes, that the dentine is formed by the direct conversion of the odontoblast cells, but believes that it is from the general connective tissue of the pulp, through a process of calcification. He says of some of his specimens: —

"Processes were seen springing from the dentine, and blending with the connective tissue of the pulp, all around the margin of the pulp cavity. On examination with a higher power, these processes have the appearance of connective tissue bundles, partially impregnated with lime salts, in advance of the main line of calcification. * * * We can no longer look upon the matrix of dentine as being a homogeneous substance, but must regard it as composed of a reticulum of fine fibres of connective tissue, modified by calcification, and when that process is complete, entirely hidden by the densely deposited lime salts. * * * In human dentine, as I have shown, trabeculæ are seen shooting inwards into the pulp from the surface of the forming dentine. These trabeculæ * * * are continuous with the connective tissue fibres of the pulp.

"While convinced that the views I have advanced are correct as far as they go, I acknowledge that they render some things, perhaps, more difficult of explanation than do those ordinarily received; for example, the nature of the dentinal fibrils, their relation to the odontoblasts, and the share taken by them in dentine formation, were more easily explained upon the hypothesis that the matrix was formed by the direct conversion of a portion of the odontoblasts. Further investigation into the contents of the dentinal tubules seems called for; indeed, the usually accepted view of the origin of the fibril has not appeared satisfactory to all observers."

"As pointed out by many observers, there is always present in developing dentine a layer of tissue between the odontoblasts and the fully calcified matrix which is on the borderland of calcification, a tissue believed by those who hold the conversion view, to consist of the consolidated masses of odontoblasts prior to their calcification, but which, according to the view of secretion here maintained, is a material elaborated by the odontoblasts and other cells, upon a connective tissue foundation. It appears probable that this tissue, being gradually saturated by the lime-salts elaborated by the cells, becomes supersaturated at a certain distance from the secreting cell, a process analagous to crystallization takes place, and the globules of calcoglobuline are deposited."

He finds that the development of tubular dentine in many essential points presents a strong analogy to the development of bone in membrane, and this would seem to be in harmony with the general law of development.

The paper is beautifully printed upon large quarto pages, and is illustrated by twenty-three colored figures from the author's own photomicrographs, every one of which will be a revelation to all histologists. We hope that every American who is interested in these studies will procure a copy, which may be obtained from the publishers of the Royal Society, Kegan Paul, French, Trübner & Co., Ludgate Hill, E. C., London. Price, five shillings and sixpence.

We are under obligations to the author for a copy.

CURRENT NEWS AND EXCERPTS.

WOMAN! GOD BLESS HER!

The following is the response of Dr. Geo. L. Field, to the toast "The Ladies," at the banquet at the annual meeting of the Michigan State Dental Society, held in Saginaw, June 2, 1892. It is too good to be lost altogether, and is therefore given a place here.

"I am at a loss to know why *I* should have been selected to respond to the toast 'The Ladies.' It would have seemed so much more proper had some of the younger members of the profession been called upon—those whom I have seen gently toying with an incipient moustache, a self satisfied expression illuminating their faces as they beheld them reflected back from their patent leather boots, and apparently fully convinced that a confiding public were deluded into the belief that their trousers were of the vintage of '92, simply because they had a crease down the front. Now I, strange as it may appear, was once just such a dude as those whom I have here described. That was many years ago, to be sure, before I had reformed, and became, as it were, 'a brand snatched from the burning.' At that time of my life, when the world was all before me, with few cares to harass and no blasted hopes to mourn, had I been called upon to respond to the toast now under consideration, I might justly have expected at least a reasonable degree of success in my effort. Now, the heyday of my life long gone by, my once beautiful auburn locks so silvered by the hand of time that I have felt it obligatory upon myself, like our worthy president, to change the color of my clothing, that the discrepancy in hue between the two may not be too pronounced, I feel that I have lost, to a certain extent, that fire of youth which stimulates the brain, and furnishes the burning words that should be forthcoming at such a time.

"The 'Ladies,' or 'WOMAN,' a name which I think has a broader and more comprehensive sense—*God bless 'em!*—the guide and director of our infant steps, the warm, loving, trusting companion of our later and often more thorny paths, and the ever present, ministering angel when 'Life's fitful dream' is drawing to an end. When the lips are dumb, and the eyelids are closing in the sleep of death, what word like that of *Mother* will cause the heart to give one last responsive throb at its mention, and the eye to brighten for one short moment, as the light slowly fades away. What holier, sweeter name e'er passed man's lips than that of *Wife?*

"But I find that I am fast drifting into the pathetic, which was not my intention when I began, for the time and place seem hardly suitable. It may suffice to say that the members of the Dental Profession wish it placed upon record, and have it go forth to the world, that, individually and collectively, here, now, and at all times, we consider woman a grand success, and so deposit our ballot. Take woman out of the world and what would be left? How could solitary man get along? Without her, is there one in this assembly who could feel reasonably sure of having a button on his shirt at the end of the first week after her exit? Some, perhaps, would try to comfort themselves with the blessed fallacy that they would never become baldheaded. But, taking everything into consideration, we can safely vote the ladies, or women, a blooming success. Every man should take at least one to board and clothe through life; some say two or three, but I doubt this being good policy, unless, perchance, they are taken one at a time. There is nothing like having a good, true, loving wife, to stand just inside the door and let one in when he returns home at night from a dental banquet, and finds a perplexing difficulty in corralling the keyhole, as it passes in uncertain flight before his disturbed vision. To be sure, this may not be the pleasantest thing in the world for the woman, but she was born to suffer. All our great poets tell us that. We also suffer in many ways. Our trousers bag at the knee, which is an infliction that woman is spared. Woman, however, cannot play base ball with any degree of success, and there we come out ahead again.

"Woman's love is, I have been told, without a limit, and the want of a limit here is safer than in a game of draw-poker; at least I am told that such is the case by my friend on my right, and he knows. But the poets, of whom I have spoken before, differ considerably in regard to the length and elasticity of woman's love; for while one whose lines have no doubt fallen in pleasant places puts on record the assertion that—

'Woman's love is like 'injun' rubber;
The more it stretches, the more you 'lub' her'—

another one, equally as dogmatic, flatly refutes what he has said by the retort—

'Woman's loving is like Scotch snuff;
You get one pinch, and you've got enough.'

"To the younger members of this association, who sit grouped about these tables, I have no advice to give in this matter, only *try it.* Find some dear, sweet little woman, whom you think you could love almost well enough to eat her up (and if she don't fill the bill you will wish that you had); rent or buy a neat, comfortable, vine-covered cottage, and settle down to a new life, and when the lapse of time shall have caused such changes in your household as shall give the twinkling stars as they peep in at your chamber window a view of a wild-eyed, white-robed, half demented man, on an endless tramp during the still watches of the night, the mocking winds will sing, or shriek, a soothing lullaby, and echoing expanse respond—

WOMAN! GOD BLESS HER!"

A SENSIBLE ADDRESS.

The annual address of Dr. F. O. Hetrick, President of the Kansas State Dental Association, which may be found in the May number of the *Western Dental Journal*, gives one the impression that his head must have been adjusted to his shoulders with a spirit-level. Here are some of the solid chunks of common sense with which the address is filled, and if in every case they are not strictly original, they have, at least, the merit of sententiousness. As the lamented Bowers said of his verses, "Poetry or not poetry, it is every word true, by jingo."

"Every dentist who has a desire to be progressive should be identified with his State Society. Left to himself, without coming in touch with others of the profession, the average dentist is liable to get into the rut that leads into the quicksand of self-conceit.

"A good many dentists of our land are going about chewing the cud of reform, which if they would spit out and have a chemist analyze, it would be pronounced sour grapes.

"The College Faculties practically admit that things have been done of which they are ashamed; but look back twenty years, and see what they have done in that short time toward raising the standard of dentistry. Be candid and fair in discussing the subject, and remember that these things do not come about rapidly. Reforms of all kinds come slowly. The colleges have not been one-half so much to blame as dentists themselves. Where has been the greatest fault in this matter of a dental education? The preceptor has been to blame in nine cases out of ten. He has sent his student to the college where the fees were the lowest and the term the shortest, thus putting a premium on a low standard; or, worse yet, he has practically told the student that he knows more than a

College Faculty; that he could teach him more of the practical part of dentistry (polishing rubber plates, boots and spittoons), than all the schools in existence.

"The day is not far distant when the colleges must have an examination in regard to an applicant's mechanical turn of mind. Those will apply for admission who, on account of their inability to comprehend the laws of mechanics, will always be a failure if allowed to study dentistry, and it would be a great kindness to refuse to admit them.

"It is the worst kind of nonsense, and a mild sort of boyishness, to say, by our acts, that we have the only honest examining board in the Union; that our State Board knows better how to examine those who wish to practice dentistry than the Faculties of reputable Dental Colleges. Our legislature did some foolish things at its last session, but let us be thankful that the fair fame of Kansas was not soiled by such a law as that passed by two of our States. Not being a graduate, and hence not speaking from a college standpoint, permit me to say that of all the outrageous laws, and there have have been some poor ones passed, the one requiring an examination of a D. D. S., who obtained his degree at any of the colleges belonging to the National Association of Colleges, caps the climax for narrowness.

"What an inspiration has this Association been to me, as I have attended its meetings. To Dental Associations, and this one in particular, I feel that I owe, more than to any other influence, my having a desire to do better work. I have gone home each time with a desire to do better, and a feeling that I have received something to help me to do so."

MELTING AND ROLLING GOLD.

In melting gold, charcoal, gasoline or illuminating gas, are the best fuels. Coal should not be employed, as the gases from it make the gold brittle. There is nothing better than the Fletcher furnaces, which are heated by common illuminating gas. The gold or alloy should be put in the crucible and a little borax added. Do not employ the great quantity that is too frequently used. The ingot mould should be warmed, but not heated. When the gold is melted, turn it into the ingot mould and let it cool. If the amount is considerable, it should then be broken into as small fragments as practicable, and melted over again, without borax. When fairly melted, add for every four ounces a piece of saltpeter the size of a pea, or a teaspoonful of sal-ammoniac and charcoal. Cover for a couple of moments and then pour.

A great deal depends upon the way in which gold is rolled. *The American Jeweler* says that unless a heavy strain be put upon it the first and second times passing, it will stretch the gold on the surface, while the middle portions not being pressed will retain the granulations of the melting process, and the gold will crack. A heavy strain at first imparts the right grain to it all the way through.

When the ingot has been rolled to about twice its length, if it be as fine as 18 K. it should be annealed. If it be an alloy less fine, it should be annealed sooner. It should not be quenched until it has become black, or it will be likely to split or seam.

DEVITALIZING PULPS.—Dr. Miller contributes to this number an excellent paper upon the devitalization of pulps. It will be seen that he depends upon cocaine for obtunding sensibility at the outset. His strictures upon the slovenly methods of many operators, who thrust in a preparation of arsenious acid and then proceed to ram it down upon the irritated pulp with a sandarac wad, are very just. His method of using zinc sulphate as a protective covering is new to us, and will commend itself to every dentist who values the comfort of his patients.

UNIVERSITY OF BUFFALO—DEPARTMENT OF DENTISTRY.

The Council of the University of Buffalo desires to announce the organization of a dental department in connection with its medical and pharmaceutical schools.

For years the University has had this step in contemplation, in order that its medical instruction might be complete in all its branches, but hitherto for lack of room it has been compelled to defer a work which it believes will be a great benefit to the profession of dentistry, to the University, and to the city of Buffalo. With the completion of the new University building, on High Street, this obstacle will be removed, as the architect was specially instructed, when drawing the plans, to include space for a dental department. The western wing of the building will therefore be devoted to the wants of a complete dental school, and of the medical and dental infirmaries. It will be in the immediate neighborhood of the Buffalo General Hospital, to whose privileges dental students will be admitted with the medical classes.

At the late University commencement, the Council unanimously voted to organize the dental department, and selected men in whose ability and zeal it has implicit confidence to form its governing board, and in their hands it has placed the details of the work. These gentlemen will call to their aid such assistance as is needed, including members of the medical and pharmaceutical departments, and teaching will be commenced at the opening of the Fall term of the University.

The Council recommends the school to the good-will of the citizens of Buffalo, and generally to the members of the medical and dental professions, and assures them that so far as their efforts can extend, the new department will be so equipped and conducted as to be in no way inferior to any of the leading dental schools in the United States.

E. CARLETON SPRAGUE,
Chancellor of the University of Buffalo.

FRANK M. HOLLISTER,
Secretary of the Council.

THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF BUFFALO desires to assure the dentists of New York and other States, that it is in hearty accord with the new dental department. Its students will be admitted to the various hospitals under their charge upon the same terms as medical students, and it hereby commends the new school to the medical alumni of the past fifty years, in the confident expectation that it will receive the benefit of their good-will and influence.

Special courses of lectures in the dental department will be delivered by such of the medical professors as may be designated by the dental faculty.

MATTHEW D. MANN, A. M., M. D.,
Dean of Medical Faculty.

JOHN PARMENTER, M. D.,
Secretary.

THE WILMINGTON DENTAL MANUFACTURING CO. sends us a copy of *Dental Jurisprudence*, by William H. Rehfuss, D. D. S., a volume of 468 pages, published by them. We have not been able to command the leisure necessary for a thorough examination of the work, but a glance at its table of contents indicates that it is very comprehensive in its scope. The subject is an important one, for while dentists are not as liable to the malpractice suits usually instigated by briefless lawyers as are medical practitioners, they are not at all uuknown, and every one should learn what are his legal rights and liabilities. In a future number we shall endeavor to give the book the attention the importance of the subject demands.

VERY RARE INDEED.

It is a rare thing for a human being to have three sets of teeth, and seldom that a baby is born with teeth; but a growth of teeth after death is, perhaps, the most odd of all such freaks. A case of this kind is reported from Cincinnati. On Tuesday last, the body of Mrs. Catharine Davis was exhumed for removal. She died in 1852, aged thirty-nine years. She had been entirely destitute of teeth for several years before her death. The coffin, when opened, revealed the features in a perfect state of preservation. But, beyond this, and much more to the astonishment of the assembled relatives, the half-opened mouth seemed almost smiling with a full and nearly perfect set of teeth of quite an inch in length.—*Exchange.*

What kind of soil is that which grows teeth an inch long in the mouths of dead people? No one has yet been able to produce them in the edentulous jaws of living persons, but here are all the minute particulars of a full set developed after death. What excuse has the editor of a grave professional journal, supposed to be published for educational purposes, for inserting such a roaring absurdity as that? Is he credulous enough to believe it to be a scientific fact, and if not, what reason can there be for the repeating of such a preposterous yarn?

AND YET ANOTHER.

Mrs. Kate Williams, a domestic of Houston, Texas, has given birth to a boy baby with a full set of teeth.—*Exchange.*

There is a mistake somewhere. Babies have been born with three or four incisor teeth, but there is not in all science the record of such an event as the above, which we find in a professional exchange. Of course we cannot dispute a statement so dogmatically made, but we prefer to believe that the baby was at least three years old when born.

DETROIT COLLEGE OF DENTISTRY.

A dental department has been established in connection with the Detroit College of Medicine. In addition to the members of the Medical Faculty to whose lectures the dental students will be admitted, the following named will constitute the teaching staff:

G. S. SHATTUCK, M. D., D. D. S., Professor of special Anatomy, Oral Pathology, and Oral Surgery.
GEORGE L. FIELD, D. D. S., Professor of Clinical Operative Dentistry.
F. W. CLAWSON, D. D. S., Professor of Operative Dentistry and Dental Therapeutics.
E. C. MOORE, D. D. S., Professor of Clinical Dentistry.
F. L. SHATTUCK, Assistant to Chair of Operative Dentistry and Lecturer on Prosthetic Dentistry.
C. R. YEARICK, D. D. S., Assistant to Chair of Clinical Dentistry.

The college year will begin September 21st next, and continue nine months.

R. I. PEARSON & Co., of Kansas City, have sent us a protest that has been duly filed. In the last number of this journal was noticed a catalogue published by them. It was not sent to other journals, or was not noticed by them. More than two hundred applications for copies have been received outside their own territory—some from Europe, South America and the Sandwich Islands—and every one referring to this journal as the source of information. It is an expensive book, and of course cannot be sent broadcast in this way, and so the publishers beg of us to say no more about it. They are fully convinced that in this particular case advertising does *not* pay. Very well! We will not mention it.

NE PLUS ULTRA.

Our English brethren are away ahead of us in some things. When a dentist sets out to be a quack there, he can discount his American confrere. If he is ignorant, he exhibits a depth and density of darkness of intelligence that leave our pretenders leagues behind. They are nowhere in comparison. For instance: At a late meeting of the Odontological Society of Great Britain, Mr. Newland-Pedley exhibited a specimen of sequestrum from the alveolar process, in which a gold filling had been inserted.

Since the last meeting, he said he had seen a patient who complained of a little hole in her gum from which there was an offensive discharge. She said there had been a gumboil over the root of a back tooth, which had led to the existing condition. The patient consulted her dentist about the disagreeable discharge, and about fifteen months ago he inserted a gold filling in the little hole in her gum. On examination of the mouth, Mr. Newland-Pedley found the gold filling inserted in necrosed bone, and with the aid of a little cocaine removed the small sequestrum, with the filling *in situ*. The specimen and model of the mouth were shown. The dentist was said to have a large practice in one of the favorite suburbs of London.

As an instance of professional ignorance and lack of even common sense, this case certainly is entirely unique. We doubt if any man who ever extracted a tooth could be found in America, who would be capable of such a thing as that. We will no longer contend with our English brethren. The palm is theirs. They have arrived at a height that is unattainable in America, bad as some of our empirics are.

FATAL CASE OF BLOOD POISONING FROM AN ABSCESSED TOOTH. — Dr. Miller sends us another case of fatal septicæmia of dental origin, for a report of which he is indebted to Dr. A. W. Baker, of Dublin, Ireland. It is that of a boy, who, in biting a nut, split one of his molar teeth. As a result there was a severe inflammation and final death of the pulp. An abscess almost immediately supervened, with deep infiltrations of the pus, and violent inflammation, succeeded by septicæmia, which resulted in death within three or four days.

Dentists should never lose sight of the fact that an abscessed pulp may bring with it the most serious complications, and that death is not infrequently the result of the blood poisoning that may be one of them.

AMERICAN DENTAL SOCIETY OF EUROPE.—The American Dental Society of Europe will hold its eighteenth meeting at Basle, Switzerland, August 1, 2 and 3. Members of the profession are cordially invited to attend. Clinics will be a special feature of this meeting. The University will place desirable rooms at the disposal of the Society, and an ingenious amphitheater for accommodating, in the immediate vicinity of the patient, a larger number of spectators than are able to witness operations under the ordinary circumstances, will be loaned by the Swiss Dental Association. Programmes may be had on application to the president, Dr. Bryan, or to CHARLES W. JENKINS, Secy.

AMERICAN DENTAL ASSOCIATION.—The thirty-second annual session of the American Dental Association will be held at Niagara Falls, N. Y., commencing at 10 o'clock A. M., Tuesday, August 2, 1892. GEORGE H. CUSHING, Rec. Secretary.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.—The annual meeting of the National Association of Dental Examiners will be held at Niagara Falls, Monday, August 1, 1892, at ten (10) A. M. All State Boards are invited. FRED. A. LEVY, Secy.

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THE CONDITION OF DENTINE IN PULPLESS TEETH.

BY DR. W. C. BARRETT, BUFFALO, N. Y.

Read in the Section of Dental and Oral Surgery, at the Forty-third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

I had promised the Secretary of this Section that I would prepare and read a paper at this meeting upon the "Condition of the Dentine in Pulpless Teeth." It was a subject upon which I had bestowed some thought, but with the literature of which I had not made myself thoroughly acquainted. I had read Prof. Miller's work on "The Micro-organisms of the Human Mouth," and his communications to the various journals, notably *The Dental Cosmos*, but not with this special subject in mind. I had not collocated his writings upon this theme, and hence had not collated them. When in pursuance of my plan this had been done, I was astonished at the thorough manner in which the ground had been covered.

Had I examined my subject earlier, I should not have attempted an excursion in this field; but having engaged to present this paper, I will endeavor to redeem my promise, premising at the outset that I can do little save to call attention to what has been done by Prof. Miller in this direction, a work which does not seem to be fully appreciated, and which perhaps will not be until each attempts, like me, specially to study it for himself. In view of his exhaustive experiments, one can but wonder at the seemingly crude theories yet held and taught by some men to whom we naturally turn for illumination. Perhaps I shall do more good by placing Dr. Miller's comprehensive studies before you for discussion, than I could by effort in any other direction, for it must be remembered that his are not mere generalizations, such as mine must necessarily be; they are the results of a long series of conclusive, scientifically conducted, original experiments and observations, and they are not to be overthrown by any inductive reasoning whatever. In view of the overwhelming original testimony which he introduces, no man has the right to dispute his deductions until he is fortified by a like mass of opposing facts, deduced from like carefully conducted experiments, or until he can indisputably demonstrate that the conclusions reached by Dr. Miller are not warranted by the results obtained. Mere mental speculation, however plausible, cannot be accepted against thoroughly demonstrated facts.

The dentine, deriving its nutriment from the pulp of the tooth through the dentinal fibrillæ, is separated from all the other tissues of the body, through investment by the cementum and the enamel. The latter tissue is not only comparatively devoid of living matter, but it is not in direct relation with any tissues save the dentine itself. For our present purposes, the enamel may be looked upon as a simple protecting cap, whose office it is to preserve the dentine and pulp from injury.

The cementum is of a different character. It is but slightly differentiated from true bone. It is in relation with a periosteal membrane, and it is nourished like bone through a system of lacunal corpuscles, connected by canaliculi. In young teeth it is not infrequently the case that there is even a kind of system of Haversian canals, traversing the cementum and dentine between the pericementum and pulp, whose office it is to assist in maintaining the vascular supply, and incidentally, perhaps, to afford nutriment to the deeper cementum corpuscles.

The dentine is yet more differentiated, and in its structure has lost the lacunal corpuscles, while the canaliculi are modified into the dentinal fibrillæ. Their office is not materially changed, nor are we to suppose that the contents of the dental tubuli differ very widely from those of the canaliculi of true bone. They form the living portion of the dentine, as the lacunal corpuscles and the canaliculi form that of the bone. The dentinal fibrillæ are in connection with the vascular pulp, and from it derive the nutriment necessary to their continued life. The corpuscles found in the bone and in cementum are absent, and hence there is little that bears a resemblance to that reticulum of true bone which forms its lamellated structure. At the extremities of the dentinal fibrillæ, we have the irregular interglobular spaces which mark the boundary line between dentine and enamel, and which may, perhaps, be considered as modifications of the cementum corpuscles, but they are not intimately connected with the dentinal structure.

The dentinal fibrillæ, depending as they do upon the vascular pulp for nutrition, certainly lose their protoplasmic vitality when separated from it. Let us consider for a moment the condition of the dentine in a tooth, the pulp of which has, without medication, just been forcibly removed. The fibrillæ have been freshly torn from their relations with the pulp, and remain, filling the dentinal tubuli as before their violent separation. Like all protoplasmic material, they are composed of the great quaternary of elements which enter into the composition of all organic elementary structures. But the dentinal fibrillæ probably also contain other elements, such as sulphur and phosphorus, which make it more near the nature of albumen. Indeed, it is probable that if we consider it as clearly albuminous, we shall not do much violence to nature. Carpenter says that this substance is the proper pabulum of the animal tissues generally, and so the dentinal fibrillæ, possibly modified somewhat, may be looked upon as albuminous in their nature.

The dentinal tubules, which contain the fibrillæ, are exceedingly minute. For the putrefaction of the contents of the tubuli, it would be essential that putrefactive organisms should enter them. While it is quite possible that these may penetrate the tubuli, it must be to but a limited extent. In the article in *The Dental Cosmos* for May, 1890, upon "The Decomposition of the Contents of the Dental Tubuli," Dr. Miller shows that from their minute size and the very small amount of nutriment for the micro-organisms which they contain, any bacteria which enter them must soon perish from want of pabulum, to say nothing of the fact that they are mostly ærobic, and so could not possibly live in the tubules for any length of time.

But not satisfied with *apriori* reasoning, he commences a rather remarkable series of experiments and observations, from which he incontestibly deduces the conclusion that bacteria do not penetrate the tubuli of undecayed dentine to any marked extent; certainly not enough to cause any necessity for the disinfection of the dentinal substances, in teeth in which there has been no decay within the pulp canals. I need not enlarge upon this. The record is open to the inspection of all, and no one has yet dared to take issue with Dr. Miller upon this point. It must be accepted, that in the dentine of the roots of teeth in which decay has made no progress, there is no infection of dentine that demands any antiseptic treatment, aside from that usual in pulp canals.

What then becomes of the contents of the dentinal tubuli? It is but necessary to consider their character to form a clear estimate of this. The dentinal fibres cannot be considered as pure albumen, for that is only found in connection with other substances in the body. But whatever its exact composition, it presents certain characteristics, one of which is its tendency, when at rest and separated from living tissue, to dissociate the watery portions, and to form a dried residuum which is insoluble. This condition may also be produced by most acids, by the metallic salts, and by creosote. The natural tendency, then, for an albuminoid fibril, would be to assume a mummified condition, most conducive to its indefinite preservation when kept in the state in which it will be found in the dentine of a tooth root.

Fibrin is but comparatively slightly differentiated from albumen. It contains the same elements, but it offers certain physical characteristics that distinguish it. Albumen is coagulated by heat, and by certain agents. Fibrin coagulates spontaneously when exposed to the air. If, then, the fabrillæ of the dentine approach fibrin in their characteristics, they will undergo the change called coagulation without the intervention of any medicinal agent whatever. It is in this condition that, if sealed up from external influences, they present the very best state for the preservation of the tissue in which they are found. Hence that condition of the dentine is best in which the contents of the tubuli have been coagulated, or separated from the watery elements, and permitted to become a kind of minute mummy within their investing sheaths.

But the investigations of Miller, to which I have already referred, determine another matter. He did not find that the mouths of the dental tubuli, in teeth from which the pulp had been removed, were opened toward the pulp chamber. He had under examination nineteen teeth. In ten of the roots of these he found the canals to be completely or partially lined with a homogeneous structure, containing very few or no tubuli, but occasionally a formation resembling a bone lacuna, and bearing a much more near resemblance to cementum than to dentine. This layer is impenetrable to micro-organisms, and therefore forms a protection to that tissue when the pulp has been removed. We find, then, that the dentine is not only protected by the cementum on its external aspect, but very often by a modification of this tissue on its inner surface.

There is, therefore, very little danger of infection of the contents of the dental tubuli. But even if this were possible, I cannot conceive that it would matter much. The amount of infectious matter would be so small, and the chance for the penetration of the gaseous products of decomposition through the dentinal tubuli, past the zone of demarcation between dentine and cementum, and finally though the cementum corpuscles and canaliculi, which are themselves filled with living matter, would be so remote, and its influence upon the pericementum so infinitesimally small, that it seems folly to take it into consideration in the presence of so much more potent factors.

Clinical experience, too, as is so plainly stated by Dr. Miller in the article to which reference has been made, does not sustain the theories of those who insist upon the possibility of infection from dentine. If the contents of the pulp canal be completely removed, the territory made thoroughly aseptic and the space finally filled, there is, so far as I am aware, no record of any trouble from the dentine. Even admitting that there exists within the dentinal tubuli matter which is susceptible to putrefactive changes, it is too small in amount to induce any disturbing condition in the presence of a pulp canal, carefully filled with a material which must seal the exceedingly minute mouths of the tubules wherever they are not already stopped by the modified dentinal layer of which Miller speaks. In the presence of so much more important things, it seems like bad judgment to elevate such a mole-hill into a mountain. It is taking tithes of mint and cumin, and neglecting the mightier matters of the law. To elevate such small matters into prominence in practice, has a tendency to induce carelessness in things that need more attention. I doubt whether there ever has been a case of reinfection of the tissues about a tooth that has had its root filled after antiseptic treatment, that cannot be directly traced to some imperfection in the manipulation, or to some infected pockets outside the tooth itself. It is well known that the usual place for the formation of an infected pocket is at or near the apex, and that there may be a penetration of the micro-organisms and the formation of infected pockets for some distance back in the bone. I have myself seen at least three such, extending back from the point of an incisor tooth until the last one was over the second bicuspid, and each of these separate pockets connected with the original one at the apex of the incisor. They were only reached by a long incision through the gum and external alveolus, extending from one to the other until the last one had been reached. If the infection had been from the dentine, it would have manifested itself quite differently.

Undoubtedly there are cases in which the infected spot is at some point in the pericementum between the gingival margin and the apex of the tooth. But this does not by any means prove that it came from infected dentine. Perhaps, after the apex of the tooth, the most usual place for the formation of an abscess is at the bifurcation of the roots of a bicuspid or molar. I believe this to be due to the fact mentioned earlier in this paper, that something analogous to an Haversian canal there penetrates the cementum and dentine, from the pericementum to the pulp. I have demonstrated such many times. Not infrequently an abscess refuses to yield to the usual treatment through the pulp canal, and for the reason that the medicaments fail to reach the infected point. But such instances cannot be said to be produced by infected dentine. There is, in truth, another foramen analogous to that at the apex, and it becomes septic in precisely the same manner as does the latter.

In what I have previously urged, we have presupposed that caries had not commenced within the pulp canal. And yet we are well aware that in cases in which the pulps had been long dead, and there has been extensive decay of the coronal portion of the tooth, there was caries of the dentine, commencing within the pulp chamber and extending down the canal. In instances like this, of course there will be thorough infection of the dentine. It will not, however, be due to decomposition of the contents of the dental tubuli, but to infectious matter, which may find its way into the hollow from external sources. It must be as manifestly improper to fill such a canal without removing the carious portions, as it would be to fill a cavity from the outside without careful excavation. Here will be an instance in which the reaming out of the canal to the depth to which caries had penetrated would be eminently proper practice. It is very seldom that this decay will extend far down the root canal, or be very deep, without such destruction of the crown and cervical portions of the root as to make preservation practically impossible.

As regards the use of coagulating agents in the treatment of root canals, I cannot conceive of any objection to them. If by any it be thought necessary that dentine should be disinfected and made aseptic, this can only be accomplished by agents which have the power of penetration in a marked degree. These are usually coagulants, like chloride of zinc, bichloride of mercury, etc. Upon this subject I can only refer to the experiments and observations reported by Dr. Miller, in an article on "The Relative Rapidity with which Various Antiseptics Penetrate Pulp Tissue," published in *The Dental Cosmos* for May, 1891.

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AN ABNORMAL PULP CANAL.

BY C. F. W. BÖDECKER, M. D. S.; D. D. S.: NEW YORK CITY.
PROFESSOR OF EMBRYOLOGY,
UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

Mrs. W., aged about thirty-five years, with a good constitution, was about two years ago suffering from severe pulpitis of the left upper second bicuspid. The tooth, five years previously, had been filled with oxy-phosphate cement. The filling was now taken out and an attempt made to devitalize the pulp, but the application had to be removed, as the pain became too intense for the patient to bear. The pulp was then treated for a few days, and when the inflammation had subsided it was capped and the cavity filled with gutta-percha.

The tooth remaining very sensitive to thermal changes, after about one year the patient decided to have it treated again. The filling and cap were removed, the pulp being found apparently in a normal condition, but as the patient insisted upon having either the pulp or the whole tooth taken out, I decided to make an application of the chloride of methyl spray and extripate the pulp.

A microscopical examination of the coronal portion of the pulp showed that, with the exception of a few spots having calcareous depositions, it had been in a normal condition. The application of the methylic spray was very painful, but the removal of the pulp gave the patient but little pain. The canal was enlarged with Morey drills, disinfected with a solution of peroxyde of hydrogen, dehydrated with absolute alcohol and hot air, and immediately filled with chloro-percha. The introduction of the filling material into the canal produced intense pain. After repeated applications of counter irritants and ice to the gum above the affected tooth, the pain gradually subsided.

Three days after this, the patient became intermittently afflicted with neuralgic pains of that side, affecting the eye, the ear and the neck. The longer the duration of these paroxysms, which lasted from one to three hours, the more severe became the pain. The tooth in this stage exhibited no signs of pericemental inflammation, nor was there any pain produced by pressure upon the gum surrounding it. I then consulted with her family physician, who prescribed tonics and anti-neuralgic remedies, but without the slightest relief.

The seventh day after the canal had been filled the tooth became sore to the touch, when I concluded to remove the filling from the canal. This produced instant relief. In removing the filling, I noticed that as soon as the instrument was pushed along the distal portion of the canal, about the middle of the root, the patient experienced great pain. It appeared to me that either a small portion of pulp must have been left in this place, or that there was an enlargement of a dentinal fibre. I made an application of a saturated solution of hydrochlorate of cocaine, and with the largest Morey crown drill reamed out the canal, which was found to be perfectly straight. As the instrument reached about the middle of the root it produced very severe pain, but as soon as the drill had passed this sensitive point it gave no pain whatever.

Upon the removal of the drill I found some blood in the pulp canal, which was thoroughly rinsed with water and dried, when an application of pure carbolic acid upon cotton was inserted.

A thorough examination the next day proved that the pulp gave off a branch running at right angles toward the distal portion of the root. This branch was about as large as the main body of the pulp in that portion of the tooth, and was supplied with blood-vessels. I then concluded to coagulate a portion of this pulp tissue by successive applications of pure carbolic acid. As there is danger of pericemental irritation after repeated use of this remedy, I closed the apical foramen with a small piece of cotton saturated with melted paraffine.

After applying the carbolic acid for six days, I removed the paraffine from the apex of the canal, and filled this portion with gutta-percha. The remainder of the pulp cavity was filled temporarily with cotton, saturated with a fresh solution of iodoform in sulphuric ether, and the cavity was closed with gutta-percha. After two weeks the temporary filling and cotton were removed again, and tin foil was substituted. The tin was introduced into the canal by means of small burnishers in the engine, the upper portion being filled with gutta-percha. All the neuralgia has disappeared, and the tooth has given no trouble since.

BENDING THE TWIG.

BY C. E. FRANCIS, M. D. S.; D. D. S.: NEW YORK CITY.
PROFESSOR OF OPERATIVE DENTISTRY FOR CHILDREN,
UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

In considering the various classes of patients who require the services of the practitioner of dentistry, none probably are more worthy of interest, or have a stronger claim upon his good care and kindly attention, than the youthful members of the community.

The condition of the teeth and general appearance of the mouth may have much to do in shaping the destinies of individuals. The young lady, with well-rounded facial contour and possessing a fine array of beautiful teeth, well articulated, symmetrically arched, regular in order or arrangement, is at once an object of admiration, and her chances for health, influence and social position will be enhanced thereby; but one with face distorted, teeth discolored, decayed and broken, will hardly fail to create in the beholder feelings of pity or disgust, while with tainted breath, vitiated oral secretions, inability to properly comminute nourishing food, loss of restful sleep and the usual nervous strain resulting from odontalgic disturbances, she is continually harassed, wearied, discouraged, and perhaps her entire life rendered unhappy and miserable.

The dentist, when examining the mouths of adults, is a frequent witness to the ravages of disease resulting from carelessness or neglect. He finds broken rows of what might have been beautiful dentures, had timely and proper attention been given them, and as he listens to the recital of bitter experiences and mournful regrets, then views the devasted condition of the oral cavity, contemplates lost opportunities and consequent penalties or duties omitted, his sympathies are touched and regrets become mutual.

He will call into execution his best skill to arrest the mischief or check the disease. He will repair the damaged organs still remaining, and fill intermediate gaps with artificial substitutes; but how vastly better had earlier attention been sought and received, and this serious mischief thus averted.

With children, however, conditions are quite different. If they visit the dentist in due season, receive such attention as they need, obey pertinent injunctions and put into practical effect the healthful advice tendered, much annoyance, pain or discomfort, perhaps for a life-time, may be prevented. In their cases are presented possibilities of possessing good, healthy dentures, which may be kept in a state of usefulness and comfort many years of their natural existence.

But even children's teeth sometimes demand the best care, and an exercise of the maturest judgment that the dentist can give or bestow, often taxing patience, ingenuity and skill to the utmost. There are also habits of mischievous tendency which they must be taught to overcome or amend, and others of beneficial influence to suggest or encourage. There are many obstacles to encounter and to conquer, irregularities and deformities to correct, and various evils to anticipate and prevent.

The temporary teeth, as well as their more permanent successors, need close and frequent watching, and should never be permitted to waste away by disease. As cleanliness is the first law of nature, so the art of keeping the teeth clean should be impressively taught to our juvenile patients. Severe or heroic operations are seldom called for in our attentions to children, and should be avoided as much as possible. They tend to make dental operations a terror and a dread, and many young people will permit their teeth to go to destruction rather than submit a second time to the trying and painful ordeal of having them roughly treated. This rule applies to operations for regulating as well as filling the teeth.

Children are very observing, and are not long in discovering whether or not the dentist is gentle and sympathyzing. In order to render them the best possible service, it is important first to gain their confidence. If this is safely secured, the dentist will, as a rule, find in children very sensible and easily managed patients.

Strange as it may seem, it is nevertheless a fact that many excellent members of our specialty do not desire children as patients, and frankly admit that they do not like the bother of operating for them. Where such feelings exist it must be difficult to give them proper care. A little kindness shown, a few words of encouragement given, a fair degree of patience manifested, and the little ones are not such disagreeable patients after all. We have opportunities here for getting in the "timely stitch," and saving many a trying stitch for the future.

It is true that children are not always presented to the dentist as soon as desirable for their greatest benefit. Through oversight, thoughtlessness, or ignorance concerning the condition of the teeth, or their needed requirements, their visits are delayed until an enemy has stirred up trouble in the dental camp, and stinging pain (a forcible reminder of omitted precaution) has compelled them to hasten to the dentist for relief. Here, then, is afforded a favorable time for a brief admonitory lecture in behalf of children and their future well-being. Interest manifested in this direction is almost sure to be appreciated, and advice tendered for their benefit gratefully received.

The children of the present day are to become our patients in the future, and giving them proper attention now and teaching them to take the necessary care of their teeth through life, will pave the way for future operations, less dreaded by the patient, less difficult and trying to the dentist, and far more satisfactory to both.

How applicable in such cases the old and much quoted aphorism: "Just as the twig is bent the tree's inclined."

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CORRESPONDENCE.

LETTER FROM DR. W. MITCHELL, LONDON, ENGLAND.

Editor Dental Practitioner aud Advertiser:—I read with much pleasure Prof. Miller's able article on "The Devitalization of the Dental Pulp," in your last number. While agreeing with him as to the care and thoroughness that should be observed in this, and I might add, all other dental operations, I must differ with him as to some of the points taken. In the first place, carbolic acid is not a good adjunct to arsenious acid for destroying the pulp, because it coagulates the serum and albumen in the blood, as well as on account of its action as an escharotic upon vital tissues, thereby promoting a non-absorptive surface, the very thing most undesirable in pulp extripation. It can be laid down as an axiom, the more rapidly the absorption of the devitalizing agent by the pulp is carried on, the less the liability for concurrent pain, and the more thorough the devitalization.

Having for a number of years carried out a line of practice identical with that laid down by Prof. Miller, I found there was quite an element of uncertainty as to probable immunity from pain, also as to certainty of the death of the pulp, caused by the carbolic acid used, this in many cases acting as an additional irritant to an already inflamed nerve terminal. For the past two years I have used oil of cloves, or if any putrefactive action had taken place in the pulp cavity, oil of cinnamon, in connection with the cocaine and arsenious acid spoken of by Prof. Miller, and while in all cases I do not succeed in securing such immediate immunity from pain as does Prof. Miller, it is practically reduced to a minimum.

I must say a sandarac dressing need not be "slovenly," "promote pressure," or become infiltrated with oral secretions, if properly made and applied. I use sandarac and cotton exclusively as a covering now, after having long used cements as a protection for arsenical applications. These can be applied without pressure to the pulp, yet perfectly seal the cavity, by a careful attention to a very few simple details, and without any danger of escape of the application upon the gum. Having previously selected the instruments and materials required, I prepare the cavity and expose as much of the pulp as circumstances will permit. If an approximal cavity is the means of ingress to the pulp, I take a small pledget of cotton saturated with carbolic acid, and apply to the gum between the teeth, to secure a non-absorptive surface, as a precautionary measure in case of any possible dislodgment of the dressing by the patient, a thing practically impossible if the dressing is properly made. Then take a pledget of cotton sufficient to make a roll large enough to fill the cervical space and extend a slight distance into the cavity, saturate this with sandarac varnish, not too fluid, express the surplus between the folds of a napkin by a rolling motion between thumb and finger, thus shaping the pledget for the place it is to occupy. Press this well between the teeth and against the gum across the cavity. Now make the arsenical application, covering it with a metal cap, which can be previously prepared from taggers' tin by using small contour pliers. Finally cover with another pledget of cotton prepared like the previous one, and seal the cavity. The space under the metal cap will leave room for a slight effusion should any take place, and thereby prevent the pain that might ensue from pressure from this cause, which is not at all unlikely, where cotton is left next to the application.

It is perhaps unnecessary for me to say here, that it is quite essential that everything about the tooth operated upon should be quite dry. I have seen two of these dressings that had been in the teeth over six months, and upon their removal the cavities were perfectly dry, as was the varnished cotton, except for about the depth of two lines upon its exterior surface.

With sentiments of sincere regard, I remain

Very truly yours,

W. MITCHELL.

AMERICAN DENTAL ASSOCIATION—THIRTY-SECOND ANNUAL MEETING, HELD AT NIAGARA FALLS, N. Y., AUGUST, 1892.

The Association met in the Casino Hall, Niagara, at eleven o'clock of the second day of August, and was called to order by the President, Dr. W. W. Walker, of New York. The usual preliminary exercises were held and the necessary reports received, after which the Society listened to

THE PRESIDENT'S ANNUAL ADDRESS.

After congratulating the Association upon its admitted influence in bringing about dental reforms and advancing professional status, the President took up the question of the World's Columbian Dental Congress. He briefly reviewed the history of the inception of the present organization, and said that this was the first opportunity that American dentists had been offered to show to the world what has been accomplished by them in the last half century. He urged all reputable dentists to participate in the congress, and to do all possible to make of it a grand success.

The college and educational questions were discussed at some length. He urged that with the restrictions of the laws, the preliminary examinations demanded, the extended terms of the schools, the lengthened sessions, and the greatly increased facilities for teaching, it was but reasonable that a graduate of any of our reputable colleges should be allowed to practice his profession in any State of the Union, without the humiliation of another examination, perhaps by men who were non-graduates themselves. There has been too much clashing between the schools and the examining boards. Some of the colleges have expressed a willingness that their students, before graduating, should be examined by their respective State boards at the same time that the Faculty examinations take place, that they may see that the qualifications are sufficient, the diploma granted after such examination to be accepted without question. The Dental Department of the University of Buffalo, he said, will graduate its students in this manner, thus obviating all danger of improper work, and setting a good example.

He recommended the appointment of a Committee on State and Local Organization, to bring the dentists of the United States into closer relationship with the Association, this committee to formulate a series of questions, carefully chosen, and to be transmitted to every State and local organization in the United States, with the request that one or more of them be taken up for consideration at its meetings, and that a report of the discussions be sent to the secretary of the American Dental Association, who should transmit it to the chairman of the proper section for presentation in a properly digested and prepared report.

As the efforts of the members next summer will be chiefly directed to the work of the Dental Congress, and as it would be inexpedient to hold two large meetings at so nearly the same time, he recommended that the next meeting of this Society be merely a business session, and that nothing save the election of officers and action upon the report of the special committee to whom was referred the amendments to the Constitution and By-Laws, be done.

After the reading of the address, the society adjourned.

TUESDAY EVENING SESSION.

The report from the first section upon the programme for the year—that of Anatomy, Pathology and Surgery—was called for, and was presented by the chairman, Dr. T. W. Brophy, of Chicago. The report embraced a list of articles upon these subjects which had been published in the different dental journals during the year. It recommended to the Association the following papers, which had been presented to the section by members:

"A New Operation for the Resection of the Inferior Dental Nerve." By Dr. M. H. Cryer, of Philadelphia, Pa.

"Pyorrhœa Alveolaris.—A Case in Practice." By Dr. J. E. Cravens, of Indianapolis, Ind.

"The Grinding Teeth of the Herbivorous Mammalia." By Dr. A. H. Thompson, of Topeka, Kan.

"A Study of the Molar Teeth of the Proboscidiæ." By Dr. W. C. Barrett, Buffalo, N. Y.

The first paper called for was that of Dr. M. H. Cryer, of Philadelphia, upon

A New Method of Resection of the Inferior Dental Nerve.

It consisted in cutting out a piece from the sigmoid notch, between the condyle and the coronoid process, until the inferior dental foramen is reached, when the nerve can be drawn forward and separated at two points. By this procedure a considerable portion of it can be resected without seriously injuring the bone, and more readily and effectively than in any other way.

DISCUSSION.

Dr. T. W. Brophy: I cannot quite agree with Dr. Cryer, that this is entirely a new process. Some of the manipulation may be new, however. Instead of cutting away the coronoid process and thus injuring the attachment of the temporal muscles, I have made an opening through the ramus of the jaw, until the foramen could be reached, and then removed as much of the nerve as could be got away.

Dr. J. J. R. **Patrick**, described the operation of Dr. Jos. Pancoast, of Philadelphia, and said this had been performed at least twice before.

Dr. **Brophy** moved that the courtesies of the floor be extended to any visiting physicians or surgeons, and it was unanimously carried.

Dr. A. E. **Hoadley**, of Chicago, said he had listened to the description of this operation with interest. The usual method of procedure is to open the inferior maxillary bone from the outside until the inferior dental canal is reached. Sometimes a cure of the facial neuralgia may be accomplished by simply stretching the nerve, but the pain is apt to return. If a section of the nerve be removed, it necessarily destroys all communication with the terminal filaments, and must result in a cure, if connection be not reëstablished.

Dr. W. N. **Morrison** was surprised that so important an operation should have been performed in the manner described. He preferred the dental drill, with which it was possible to open up the nerve canal without making any serious wound.

Dr. Thos. **Fillebrown** did not think resection of the nerve a permanent operation. The pain was too often an affection of the nerve centers. Nearly the whole of the nerve can be removed through the mouth, without the external incisions suggested by Dr. Hoadley.

Dr. **Brophy** has never had occasion to make an external opening for resection of the inferior dental nerve. He thought that all openings from the outside should be avoided. The resection can be made within the mouth by using a little care, and an unsightly scar thus be avoided.

Dr. **Cryer** said that he hoped that gentleman would not think that he recommend a grave operation when a more simple one would answer. The method which he had presented was one to be adopted when it was necessary to remove a considerable portion of the nerve, and it was distinct from any of the others mentioned. It essentially consisted in opening from the sigmoid notch down until the foramen was reached, when the nerve could be seized, drawn outward and cut. He did not cut away any portion of the coronoid process, nor did he interfere with the function of the temporal muscle.

PYORRHŒA ALVEOLARIS.

A paper having the above title was read by Dr. J. E. Cravens, which was the history and treatment of a case in practice. The patient was a male, 50 years of age, robust, but under treatment for affection of the nose and throat. The gums were red and turgid, bleeding easily.

Considerable pus could be expressed from about the eight anterior teeth, with deep pockets about the proximal faces of some of them.

The teeth were cleaned, the pockets washed out with hot water and treated with dilute sulphuric acid, (1 to 10), pulverized sulphur to be used as a dentifrice morning and night. This was continued for three days without any material diminution of the pus, when a change was decided upon, and the pockets were treated with a ten-per-cent. solution of nitrate of silver, after the washing with hot water. The beneficial effects of this remedy were observed the next day, there being but little pus. The treatment was continued for eight days, when all the bad symptoms had disappeared, and the pockets appeared to be filling up by granulation.

The nitrate of silver caused a slight brownish discoloration about the necks of the teeth treated, but exhibited no caustic effects. The essayist believes that the good result was partially due to the hot water with which the pockets were washed out at each sitting. The preliminary use of the dilute sulphuric acid also aided by removing small particles of calcareous matter, and by stimulating the parts. The case appears to be cured entirely, and in an incredibly short space of time.

DISCUSSION.

Dr. W. C. **Barrett**: This subject is of too great import to be passed lightly by without debate. The etiology of the disease has never yet been fully comprehended. Whether it be the result of a constitutional diathesis, or the manifestation of a merely local disturbance, we are not fully assured. Whether the most effective treatment is by means of general or topical remedies, no one has indisputably established. For myself, I have usually found that local applications are only palliative. They relieve the acute symptoms and reduce the inflammation, for a while stop the flow of pus, but only to allow it to return again after a time. I have flattered myself that a great many cases were cured when the outward manifestation of the trouble was no longer exhibited, and have seen it return with renewed virulence when remedial measures were for a while suspended. This is in cases of true pyorrhœa, and not the inflammations and degenerations that may arise from deposits about the teeth, or lack of hygienic care. But this does not relieve us from the obligation to do all that is possible. The results secured by Dr. Cravens are remarkable and commendable, even though they did not continue a month.

Dr. M. L. **Rhein**: From some of the symptoms in the case of Dr. Cravens, it seems to me that this was not an instance of true pyorrhœa. A careful diagnosis is necessary before intelligent treatment can be entered upon. The etiology of the disease is fully established in my mind. It arises from a faulty nutrition of the parts. Care should be taken to learn the exact condition of the patient, and whether or not there be a constitutional disturbance. I have had many failures in treatment, and in such cases I usually have found that there was a gouty condition.

Dr. W. H. **Morgan**: I believe pyorrhœa to be constitutional, and the result of inheritance. The treatment should be general. And yet it is a local manifestation, for it may always be cured by one measure. Extraction of the tooth never fails.

Dr. **Barrett**: But extracting, like amputation, is of itself a confession of failure.

Dr. A. W. **Harlan**: The results of the treatment of a single case do not establish a principle. The sulphuric acid employed was useful as a preliminary measure, for dissolving the salivary calculus. The nitrate of silver is a powerful astringent and stimulant. But eleven days is an incredibly short time for these remedies thoroughly to exhibit their characteristic action. Hot water is a very valuable therapeutic agent.

Dr. **Cravens**: I desire again to call attention to the fact that in the use of a ten per cent. solution of nitrate of silver there was no manifestation of its action as a cauterant. I can not agree with Dr. Rhein, that this case was not one of true pyorrhœa, but only a manifestation of local irritation.

A paper was read by Dr. A. H. Thompson, of Topeka, Kan., upon

The Grinding Teeth of the Herbivorous Mammalia.

The molars of these classes present an interesting and remarkable example of high specialization. The complex structure of the masticating surfaces is produced by an arrangement of the dental tissues, the harder alternating with softer, thus insuring that ridged surface of the millstone, which is most effective in comminution of the food. A study of these tissues enables the paleontologist to classify the fossil remnants of orders. Their homologies may easily be traced. It is satisfactorily proven that the single-toed horse of to-day is descended from five and three toed ancestors, which have all his characteristics as regards teeth.

The most highly specialized group is that of the ruminants. The complexity of the tooth structure is the result of peculiar folds of the formative capsule, which involves the tissues, both longitudinally and transversely. The convolutions of the dentine, enamel and cementum, differ in different families. In the horse there is a marked crescentic form of the buccal surface of the tooth. In sheep and goats the outer depressions are broad and shallow. In the hog the molars progressively increase in size from front to rear. The first true molar primarily shows three cones, with smaller subdivisions formed by the wrinkled enamel and an anterior and posterior ridge. When worn down somewhat, the enamel coats of these lobes form three islands, arranged in a triangle. The antelopes, the bovidæ, the cervidæ or deer, the giraffe, the camel, all have distinguishing characteristics.

The proboscidians are an interesting group. The mastodon has teeth divided into wedge-shaped ridges. In the elephants these are divided into plates of enamel and dentine.

The rodents have a complicated structure of the molars, which differs in different species. The crowns of the superior molars of the higher mammalia are supported on three roots, two external and one internal. The inferior molars are supported by two roots.

The teeth of each animal are adapted to its needs. In the course of the interminable ages, during which the different species have been developing, the surrounding circumstances—the environment—has dominated the direction of the various changes, and the several steps can be traced in the character of the teeth.

It is commonly believed by naturalists that the Lamarckian theory of use and disuse, or the mechanical effects of use, have been the principal influences in the development of tooth forms. In elephants and mastodons the jaw movements are from behind forward. This antero-posterior movement has developed the form which offers the greatest resistance to this movement in mastication, and consequently the greatest efficiency in reducing food.

The primitive movement is that of the carnivora—the simple opening and closing of the jaw. Then follow the backward and forward movement, as in the proboscidiæ, and other primitive types. The lateral movements succeed, and finally the triangular movements of the jaws of ruminants and vegetable feeders. The forms of the teeth are modified by these movements, as are the shapes of the condyles and the glenoid fossæ. This modification may lead to changes in the roots of the teeth, as in the rabbits and hares. It is illustrated also in the teeth of the cervidæ and the rodentia.

Enough has been shown to prove that the origin and method of evolution of the intricate and complicated structures are brought about by the uses to which the teeth are put, and this results in the specialization which we see in all orders.

Adjourned.

WEDNESDAY MORNING'S SESSION.

After the usual preliminary business, a paper was read by Dr. W. C. Barrett, of Buffalo, upon "A study of the Molar Teeth of the Proboscidians." As this paper and the one read by Dr. Thompson were upon cognate subjects, both were discussed together.

[The abstract of this paper, with the discussion, is deferred.—EDITOR.]

The report of Section I.—

PROSTHETIC DENTISTRY, CHEMISTRY AND METALLURGY,

was called for. The Chairman, Dr. W. B. Ames, of Chicago, announced that there was no formal report. There were no papers, but Dr. George Evans had promised to describe a process of enameling gold crowns, and Dr. Melotte would give a clinic, illustrative of a new fusible alloy which he had compounded, and which melted at a very low temperature, and of a new method of getting the articulation in bridge-work. The Chairman called attention to a new plastic filling, oxy-phosphate of copper, which was designed to take the place of the zinc fillings. He presented a resolution enlarging the scope of the Section, by adding to it bridge-work and orthodontia. Heretofore papers on those subjects have usually been referred to Section IV., but it was thought that they more properly belonged in Section I. There was frequently a dearth of papers in the latter Section, while in the former there was a superfluity. The Section, therefore, asked that papers upon those subjects be sent to Section I.

DISCUSSION.

Dr. F. W. Low asked what advantage was claimed for the oxide of copper, and what was the rate of crystallization as compared with the oxide of zinc.

Dr. AMES answered, that it appears to have a greater density than the zinc cement, and it can be inserted in almost a fluid state. It sets very rapidly at the temperature of the mouth. This could be overcome when desirable, by mixing the cement upon a cold slab. A square bottle filled with ice water answered admirably.

Dr. George Evans, of New York, presented a

METHOD OF ENAMELING GOLD CROWNS.

The crown should be made of gold and platina crown metal. After fitting, the buccal side is indented and the enamel laid on with a brush, and it is baked in a special furnace. The necessary manipulative processes were described, and the difference explained between this method and others which have been presented.

DISCUSSION.

Dr. A. H. THOMPSON: In the use of such an enamel, the ability to secure any desirable shade is of great importance. Can this be done by this process, and if so in what manner?

Dr. EVANS: It is fairly well controlled by repeating the coatings, and baking until the right color is received.

Dr. Thompson: How do you control the heat in your method of baking?

Dr. Evans: Very easily; by watching the case. It requires some practice, but the color is the guide.

Dr. A. N. Priest: How much platina is there in the metal used for crowns?

Dr. Evans: From three to four per cent. of platina in pure gold.

Dr. W. C. Barrett: How does this process differ from that presented by Dr. Timme, at Saratoga, last year?

Dr. Evans: That process produces no such results as does this. That was likely to crack off from the crown, while this is secure against such injury.

Dr. H. J. McKellops: I saw at Berlin, two years ago, an enameling process that was presented by Dr. Cunningham, of England. Is this composition a secret?

Dr. Evans: I do not make it, but purchase it of a firm in Philadelphia. The credit for first producing these glass enamels should be given to Wilhelm Herbst, of Bremen. He first made the fusible glass enamels, by triturating common glass of different colors.

Dr. S. H. Guilford: The enamel of fusible glass has been in use for many years, for enameling the dials of watches.

The report of Section II.—

Dental Education, Literature and Nomenclature,

was read by Dr. Louis Ottofy, of Chicago.

Upon the subject of education, the report stated that at the close of the last session of this Society, the number of colleges in active operation was thirty-three, there having been no increase from the previous year. Since that time there have been established the following schools:

1. Dental Department of Tennessee Medical College,
2. Chicago Tooth Saving College,
3. Dental Department of the Homœophathic College of Cleveland,
4. Dental Department of Western Reserve College, Cleveland,
5. Dental Department of the University of Buffalo,

the total number now being thirty-eight.

Since 1886, the graduates have been as follows:

1886	503	1890	963
1887	597	1891	1241
1888	746	1892	1483
1889	796		

making a total of 6,329, and an average in seven years of 904 per annum.

The three-year term entered upon last year, does not seem to have had the effect of lessening the number of students, as there were never so many as now.

There are now, according to the list gathered for this report, 130 local societies in the United States, with an aggregate membership of 5,000. Two years ago twenty-two of these societies were represented in this Association. Last year there were twenty-four.

One of the most marked evidences of progress is the formation of reading courses, and a Post-graduate Association, founded upon the Chautauqua idea. Books have been selected and courses of study instituted, and everything bids fair to make of this an important educational factor.

In literature, a number of important advances have been made. Our journals are much better than they were a few years since, and there is now but little copying done. The following are the most important works of the year:

Harris' Dictionary of Dental Science, fifth edition;
Sewill's Dental Surgery, third edition;
Gorgas' Dental Medicine, fourth edition;
Talbot's Irregularities of the Teeth, second edition;
Black's Descriptive Anatomy of the Teeth, second edition;
Catching's Compendium, second volume;

and the following new works:

Dental Jurisprudence, by W. T. Rehfuss, D. D. S.;
A Chart of Typical Forms of Irregularities, by E. S. Talbot, M. D., D. D. S.

DISCUSSION.

Dr. W. W. **Allport** thought that the Chicago Tooth Saving College ought not to be placed in the list. Its very name was enough to discredit it, and it should not be dignified by being recognized in such a report.

Dr. Jas. **Truman** desired to endorse all that Dr. Allport had said. The school named should not have been placed in the list of recognized colleges, and all mention of it should be stricken out.

Dr. J. E. **Cravens** thought the fact that it was incorporated under the laws of Illinois was enough of warrant for placing it in the list. It had an existence, and was engaged in teaching, and it could not be entirely ignored.

Adjourned.

WEDNESDAY EVENING'S SESSION.

The committee to whom was referred the recommendations contained in the President's Address, made their report. They recommended that an appropriation of five hundred dollars be made to the treasury of the World's Columbian Dental Congress. The committee thought it impracticable to secure appointments to State Examining Boards from any other than political sources, as the members are State officers, but if the State Society embraces eighty or ninety per cent. of the reputable dentists of the State, the Governor would, no doubt, listen to their suggestions, and make appointments in conformity to their wishes.

Concerning Uniformity of State Laws, the committee could see no way of accomplishing this save by a leveling downward instead of upward.

The committee recommended, in conformity to the views of the President, that a standing committee, to be called The Committee on State and Local Organization, be appointed, to consist of three members, who should serve for terms of one, two, and three years, their duties to be those set forth in the Annual Address.

They also recommended that the time for the next meeting be Tuesday, August 15, 1893, and that the report of the Special Committee on Amendments to the Constitution be laid over for consideration at that meeting. The report was adopted.

The report of Section III., upon

OPERATIVE DENTISTRY,

was made by Dr. A. W. McCandless, secretary of the Section. He said that during the year there had appeared in fifteen dental publications, about sixty articles upon Operative Dentistry. The topics embraced were about thirty. The themes are very suggestive, and an examination of them shows what the prevailing thought is. For instance, only one article was written upon capping exposed pulps, whereas a very few years since that would have been the title of perhaps half of them, and of these the majority would be by men very young in the profession.

No new book on Operative Dentistry has been published during the year.

A new cement has been offered, Dr. Ames' Oxy-phosphate of Copper. A number of new appliances have been devised by different members of the profession.

But two papers were recommended by the Section. The first was upon

REPLANTING AND TRANSPLANTING TEETH,

by Dr. W. N. Morrison, of St. Louis. He said, that of the cases reported by him to this Association in 1875-6, there are two replanted ones still in the mouth, in good condition. One of these was constitutionally the worst subject that could have been selected, while the majority of those from whom the teeth dropped out in a few years, with the roots resorbed, were apparently favorable ones.

The clinical history of a number of cases was related, in some of which there was erysipelas and blood poisoning, with the consequent fever, but all of which recovered. Occasionally there was resorption and loss of the implanted tooth, in which case another was usually inserted.

The attendant at the ordinary dental meetings would get the impression that teeth were never lost, and yet from the mouths of the better class of patients some one is constantly extracting teeth and roots, and vacant places are thus left to be filled with ghastly porcelain substitutes, which work mischief to adjoining teeth. The slaughter houses are not responsible for all the toothless people.

Into all sockets having a good alveolar process, for years it has been the practice of the essayist to transplant teeth. Whenever he removes a single root, or two, the jaws seem very tolerant to all such operations. With him it is an indispensable operation, and since Dr. Younger has introduced the practice of using dried specimens, it is always convenient, though the more nearly fresh the tooth is the better.

As in all cases of fractured or injured bone, security in position and absolute rest are essentials to healing. To secure this, the essayist uses figure-of-eight suspensory copper-wire ligatures, from the crowns of the adjoining teeth, frequently holding them in place and keeping the interdental spaces by phosphate cement worn for six or eight weeks.

The reading of Dr. Morrison's paper was followed by the presentation of a paper upon

MATRICES,

by Dr. J. E. Cravens, of Indianapolis. The essayist said there was a wide difference between matrices and mere supports for the filling material. A matrix for filling should be thin, to secure economy of space, should conform closely to the margins of the cavity, and be sufficiently malleable or flexible to enable the operator to bend or dilate it to any extent desirable. It should be cheap enough to throw away when once used. Extensive preliminary wedging should never be necessary to its adjustment.

With this matrix, perfect results can be secured in adaptation, form and contour, if it be properly made and intelligently used. The weak point is at the margins of the cavity. Especially is this the case with gold, which will not thoroughly support them unless it be used in excess, and this is impracticable when inflexible matrices are used.

A supporter should be used between teeth when proximal fillings are to be inserted, for the purpose of holding in place the beginning of the filling until it can be made secure. This should be inflexible, as it does not affect the contour. It should not conform to the margins of the cavity, because an excess is demanded there for dressing down, and it should not cover anything more than the base of the filling.

Matrices offering the advantages named in this paper may be made of German silver, strips of which, of the right thickness, can be cut and fitted around the cervix of the tooth, and made to conform to its curves and irregularities, as in the fitting of bands for gold crowns. The strip should be closed with a lap-joint, and fastened with soft solder. Such an one may be spread in any part to give contour to the filling.

They are especially useful for inserting plastics. In amalgam fillings they may be left on until the amalgam has set, when they can be cut apart and removed.

DISCUSSION.

Dr. Geo. L. Field: Will Dr. Morrison say how many implanted teeth he has lost within five years from the time of their insertion?

Dr. Morrison: Probably not twenty per cent.

Dr. J. A. Swasey was glad to know that Dr. Morrison had met with so comparatively few failures. Dr. Younger, some time ago, reported a greater number.

Regarding the use of matrices, he did not desire anything flexible. While steel was not the best material of which to make them, he desired something that could be made rigid. He preferred brass. He does not like to fill a tooth unless he can see every extremity of the cavity. If teeth are not separated so that they are fully exposed, a perfect operation cannot be expected. The matrix has been a boon to many operators, but it has been abused. Its principal use is to make of a compound cavity a simple one.

Dr. H. J. McKellops: I think the matrix a very useful inplement, and Dr. Jack did the profession a great service when he presented it. In using it, I first get plenty of room. I must see what I am doing. Then the edges must be so shaped that the matrix can be perfectly adapted to them. The rubber dam must be put on, and then when the matrix is inserted it will not be closely adapted at the cervical edge, and a wedge must be driven in to hold it up firmly. I do not believe in the band matrix, because it will not give shape to the filling, and I cannot so well see what I am doing when I use it.

In implanting teeth, the majority are flat failures. A few last five or six years, but these are exceptional. I extract teeth, and I have little patience with the men who claim they do not.

Dr. J. TAFT: This may seem a small matter, but it is an important one. There is a great diversity of opinion about the use of the matrix. Many kinds have been presented. Any of them may be used in some cases, but there is a great deal of defective work because of them. They leave unprotected margins, and this is the point that most needs protection.

There is much of good in the partial matrix, which only protects the base of the filling, the main portion being made without a matrix. A good filling can thus be secured, with perfect margins.

Dr. E. T. DARBY: Concerning implantations, the impression seems to rest upon the minds of many that they are temporary. I have seen many such that are perfect after six or more years. Some time ago, Dr. Younger implanted a number of teeth in one mouth. All succeeded except one, and in place of this I implanted another. That was more than six years ago, and they are all perfect to-day.

There are a number of theories concerning the method of attachment. It is by an anchylosis in some instances, probably, but I have seen some that appeared as movable as the ordinary tooth. I have in a number of instances put artificial crowns upon roots and implanted them, and they have served a good purpose. Implantation is quite a legitimate practice. Even if a tooth does fail after five or six years, another can readily be inserted in its place.

Dr. W. H. MORGAN: I must differ from some of the speakers. I do not understand there can be any such thing as a bony anchylosis. There is an anchylosis of a joint, but that is not claimed in implantation. I think the tooth is held by what is known as gomphosis, and there is never any bony union by deposit of osseous tissue.

It has been asserted that teeth cannot be filled unless one can see every part of the cavity. Some of the most satisfactory operations I have ever made have been in posterior approximal cavities, when I could see but little of it. I used a glass, to be sure, but I depended mainly upon an educated sense of touch.

Dr. MCKELLOPS: There is no such thing as perfect work. Dr. Morgan can not meet with the success in cavities which are not opened to sight that I can by cutting through the crown until I have exposed the whole to its utmost depths.

Dr. MORGAN: A filling that perfectly preserves a tooth is a perfect filling, no matter how inserted.

Dr. LOUIS OTTOFY: It was unfortunate that Dr. Younger implanted teeth as indiscriminately as he did, for he thus invited failures. This he did not probably do in private practice. I have lost several cases in which the enamel cracked off. Now, I always cut off the crown, and attach a Logan crown, thus making a stronger tooth. Nearly all my early cases were failures, but this was because of my lack of knowledge. Average implantations will last from five to seven years, and then others can be inserted in their places.

Dr. V. H. JACKSON: I should be glad if Dr. Allport would give us his experience with soft gold. At the present time I think we are returning to that form of foil.

Dr. W. W. ALLPORT: A perfect filling would be one that would fit the cavity like molten gold. Such an one was never yet inserted. A saving filling is what we want, and that is all we can hope to secure. Cohesive gold answers some purposes excellently, but it will not take the place of non-cohesive. We cannot do without either. To get light for the future we must examine the past. Forty years ago we had only non-cohesive gold. All who then made any pretensions to filling teeth were good operators, but they were few in number. The fillings made by these men with soft foil might disintegrate piece by piece, but what was left would preserve the tooth as far as its influence extended. The great lack in that day was a surface that would not disintegrate, and that would withstand mastication. This could not be produced with the soft gold then used, but there was an adaptation to the walls of the cavity that cannot be secured by the cohesive gold of the present day.

Crystal gold was felt to be a great step in advance, simply because it would hold together. But the teeth discolored under it, which was never the case with the old soft foil. The crystal gold fillings did not perfectly fit the cavity. What we need is the adaptation of that early day, with the hard surface of the cohesive gold of to-day.

I have filled hundreds of cavities that I could not see the bottom of. I use the mallet, but I cannot do with it what I can do without it, nor can any experienced man. With the mallet and cohesive gold, every point of the cavity being exposed, one cannot save teeth as with soft gold and only the sense of touch. The tendency of the mallet is to draw the gold away from the walls. No man can avoid that.

Dr. McKELLOPS: I can avoid that.

Dr. ALLPORT: You cannot overcome the inherent tendency of the mallet. You may in degree. You may not weigh as much as another man, but you cannot overcome the force of gravity entirely.

Dr. SWASEY: It has been stated that with the matrix the whole of the cavity cannot be seen. I use the matrix, and I see every part of the cavity. I fill teeth sometimes without seeing the extreme points of the cavity, but in such cases I use soft gold, and wedge it into the undercuts.

Dr. T. W. BROPHY: In looking up the history of the matrix, I found an article written by Dr. William H. Dwinelle, twenty-five years ago, on its use. I think the credit for its invention belongs to him. It is a very useful article if the one using it knows its proper employment, and if he has a properly constructed matrix. Otherwise it is a curse.

Adjourned.

THURSDAY MORNING'S SESSION.

After the opening exercises and the regular morning's business, the report of Section V. was called for —

MATERIA MEDICA AND THERAPEUTICS.

It was presented by the Chairman, Dr. A. W. Harlan, of Chicago.

The report said that one of the most recent of the products of the present activity in research is Europhen. It is a yellow, amorphous powder, which adheres tenaciously to the mucous membrane, to wounds, and to the unbroken skin. It is insoluble in water and glycerine, but easily soluble in alcohol, ether, chloroform and fatty oils. It is easily decomposed, especially in fats combined with starch; therefore, all mixtures which contain starch are to be avoided. It must be protected from the light, and kept in a dry place. It is used instead of iodoform. When applied in powder to gingival inflammations produced by the setting of crowns and bridges, the swelling and redness are promptly reduced. When applied to syphilitic mucous patches of the cheeks and tongue, it is especially efficacious. Applied to a suppurating or inflamed pulp, it promptly subdues the pain. It may be applied in powder, or rubbed up with lanoline, in the proportion of 1 of europhen to 3 of lanoline. In inflamed sore mouth under rubber plates, this paste is very efficacious.

Tri-chlor-acetic acid is found in colorless crystals, easily soluble in water or alcohol. It is a powerful caustic, quickly destroying the epidermis or mucous membrane.

It is a product of the oxidation of hydrate of chloral by means of nitric acid. When diluted with water to three per cent., it is an excellent local astringent and stimulant. When it is used to soften and decalcify the seruminal deposits upon the roots of teeth, a ten-per-cent. solution in water should be used. It may be neutralized by any suitable alkaline solution, like soda or magnesia, when it is desired to limit its action. It seems to have a peculiar power to soften and remove the sanguinary deposits on teeth, without injury to those organs, or to the tissues.

In all cases where an efficient preparation of iron is needed, the formula devised by Dr. G. W. Weld is to be preferred to other pharmaceutical preparations, as it will not injure the teeth. As dentists, it is our duty to insist that medical men shall prescribe this form for our patients, when any is to be used. The dose is one tablespoonful, diluted with three times its volume of cold water. It is a diuretic, and is useful in anæmia, erysipelas, diphtheria and neuralgia, and in many cases it has not its equal as a prompt remedial agent.

A further report was presented by Dr. George E. Hunt, of Indianapolis, the Secretary of the Section.

He said that Pental, an old compound with a new name, had lately been introduced as a general anæsthetic, with considerable success. It is a colorless, highly inflammable, very volatile liquid, insoluble in water, but soluble in alcohol, ether and chloroform. Unlike ether, it is absolutely non-irritant to the mucous membrane of the mouth and the respiratory passages. Its administration is unattended by nausea, exhileration or muscular activity. Anæsthesia is produced as rapidly as with nitrous oxide, but the action is more prolonged. Consciousness is regained gradually, and recovery is rapid and complete. Full anæsthesia may be induced in from three to five minutes, the narcosis lasting four or five minutes. It is administered about the same as ether. Dr. H. C. Wood has experimented with it, however, and pronounces it more dangerous than chloroform.

Chloride of ethyl has proved itself a local anæsthetic of considerable value. It comes in ten-gramme flasks, and it is so volatile that it is difficult to save any when once the flask is opened. For lancing abscesses, extracting teeth, etc., when a general anæsthesia is not desirable, it is of great value.

Aristol is designed to take the place of iodoform. It is non-irritant and non-odorous. It comes in the shape of a reddish powder, soluble in ether and chloroform, and in some oils. The chemical combination is readily broken up, when iodine and thymol are liberated. An excellent root-canal dressing may be made by rubbing up aristol in one of the essential oils, such as oil of cassia, or cinnamon.

Nitrate of silver, for the arrest of decay, although not a new feature in dental therapeutics, has lately received considerable attention, through the experiments and results achieved by Dr. E. A. Stebbins, of Shelbourne Falls, Mass. In the deciduous teeth, and in those of adults where imperfection of the enamel has resulted in superficial decay, and especially in the excessively sensitive cervical cavities so frequently met with, it may be employed with great advantage. A serious objection to its use is the blackening that is produced, but in deciduous teeth this is of comparatively little moment.

Bichloride of mercury has for a long time been the chief reliance in surgery, for producing an aseptic condition. Koch recommended it as the most efficient of all known disinfectants, in 1881. Charles T. McClintock, A. M., of the University of Michigan, has lately performed some hundreds of experiments. His conclusion is that Koch and others based their opinions upon faulty observations, and that the high rank heretofore given corrosive sublimate as a germicide is without warrant. While it has no great germicidal powers, it may be a valuable disinfectant. La Place long since called attention to certain characteristics of mercuric chloride, which would seriously interfere with its germicidal action.

DISCUSSION.

Dr. **Frank Abbott**: I am astonished at the second paper. Astonished that so many competent men can so long have labored under what the author says is a delusion, in supposing that bichloride of mercury is an antiseptic. If there be anything on earth that can destroy organic life it is the bichloride of mercury. All the world is united in this belief. It is the standard antiseptic in all surgical practice of to-day, and there is not one present, probably, who has not personally witnessed evidences of its power. It will remain a standard, notwithstanding the reports of this experimenter.

There is nothing in the pharmacopœia that can take the place of chloride of zinc. Its astringent, escharotic and stimulant properties, with its cleanliness and freedom from staining qualities, are not found in any other remedy. It will do its work more kindly than sulphuric acid.

The new remedy proposed by Dr. Harlan I know nothing of. If it will surely heal the excoriations made by artificial plates, it may prove a good thing.

Regarding the preparation of iron introduced by Dr. Weld, it is peculiar. If it stands in the office for ten days, there will be a precipitation filling one-half the depth of the bottle. This is the iron which separates, and it is not, therefore, a stable preparation. It is not acid, and hence will not injure the teeth. If it can be made stable, it will probably prove useful.

Dr. **J. S. Marshall**: Regarding antiseptics, as Dr. Abbott says, most surgeons rely upon the bichloride of mercury. But it is not adapted to some uses. There are many surgeons who are altogether abandoning the use of antiseptics in operations. They rely upon cleanliness, and claim to get quite as good results as when they used the different antiseptic washes and dressings. One in Chicago now sterilizes his instruments in boiled oil, and washes all the parts operated upon with sterilized, or boiled water. The discharges from surgical wounds are simply washed away with sterilized water, and are thus kept as clean as possible, and that is all. I have seen many of his cases, and he has had as good results as the other surgeons who employ the different kinds of antiseptics.

Concerning anæsthesia, the report of Prof. Gurlt, Chairman of the German Surgical Congress, is very instructive. The number of deaths is thus summarized:

Chloroform	94,123	administrations,	36	deaths.
Sulph. Ether	8,432	"	1	"
Chloroform and Ether .	2,891	"	1	"
Ether and Alcohol . .	1,380	"	no	"
Bromide of Ethyl . .	2,179	"	no	"
Pental	219	"	1	"
Total	109,224		39	"

Dr. Francis Peabody could not comprehend why all the standard remedies of the past should be thrown aside. Carbolic acid seems to be absolutely ignored, although it has stood the test of years, while these new remedies are almost untried, save by some inconclusive, uncertain experiments. Iodoform, eucalpytus, are thrown aside because of their odor.

He exhibited an apparatus for the application of iodine, which is fused by heat and the vapor carried to the place needed. The results of its use have been simply wonderful. It will perfectly disinfect even the dental tubuli, and leave an insoluble deposit of iodine. So penetrating is this vapor that it will pass through the tooth, from the pulp chamber to the pericemental membrane. Teeth have been treated that were so loose as almost to fall out, and in a week they were solid. In Louisville, 600 cases have been treated, with but one or two failures, and those were from improper manipulation.

The odor is not as bad as that of iodoform. The greatest difficulty in its use arises from the corroding of instruments. The deposit of iodine left by the vapor is insoluble in water, is non-irritant, and is a permanent antiseptic. The whole pulp canal might be filled with it. It has been in use but a short time, and it is a subject for research.

Dr. Abbott: There is one thing concerning antiseptics which should be known. A few years ago carbolic acid was universally accepted as the best antiseptic in use. Now, those who use it in practice find it efficacious, while the experimenters claim to have seen organisms growing upon the crystals of it. Investigation shows that when carbolic acid is properly diluted it destroys microbes, but the pure crystals are in a state that prevents their penetrating the substance of the organisms. It may be the same with bichloride of mercury. I never use that in the mouth in a stronger solution than 1 to 10,000. Some of these would-be authorities either falsify the record, or their experiments are crudely and incorrectly performed, for they get results that are not in conformity with established truth.

Dr. THOMAS FILLEBROWN: It is not the organisms themselves that cause the trouble. They will perish in healthy tissue as quickly as in antiseptics. It is the dead tissues that afford food to the bacteria, and the ptomaines that are the result of their action. If in a surgical operation there be no dead tissue or foreign matter left, there will be no septicism. In experimenting, different men get different results, and this proves there must be something wrong. Any antiseptic strong enough to kill bacteria will injure the tissues. Cleanliness is all that is needed.

Dr. C. N. PEIRCE: The new remedy, tri-chlor-acetic acid, is an excellent cauterant. If a piece of wood dipped in it be thrust into an alveolar pocket, it will dissolve every vestige of any deposit. It has a happy effect upon the tissues themselves. If it be thrust into septic roots it acts better than carbolic acid.

Dr. J. D. PATTERSON: The report has proven suggestive to me, especially concerning nitrate of silver. We find the teeth of many young persons affected by incipient decay, and this probably may be arrested by the use of this remedy. I have been experimenting with it, and have secured very favorable results, considering the short time that has elapsed. We cannot fill such teeth, and if there be any other method of treating them and arresting the decay we all wish to know it. The practice is not new. If any one has had an extended experience with it I should like to know it.

Dr. J. TAFT: More than forty years ago, Dr. James Taylor, of Cincinnati, recommended the treatment of incipient decay with nitrate of silver. He used it in both deciduous and permanent teeth. Ever since that time I have used it occasionally, and have been pleased with the results. Dr. Stebbins, of Massachusetts, has presented cases in which decay seemed to be quite arrested by the use of this preparation. In my practice it has at least retarded decay.

Dr. JAMES TRUMAN: Ever since I have been in the profession, whenever anything new came up there has always some one arisen to claim a prior discovery. Dr. Taft says he has used nitrate of silver forty years. Why has he not given it to the rest of us? I have no confidence in such statements. I have been in dentistry more than forty years, and no paper on this subject has been produced. I hold that Dr. Stebbins is the originator of this process, and I believe it one of the most important things introduced for a long time. I am not willing to see the credit taken from him in this manner.

Dr. TAFT: Either what I state is true or it is false. Dr. Truman says that it is not true. I said that I saw this used forty years ago, and I gave the name of the one presenting it. I did not claim anything for myself.

I have not kept the information hidden, but have presented it at different times.

Dr. JAMES MCMANUS: The use of nitrate of silver is not new. It has been employed for many years about the roots of teeth, and I have a distinct recollection of its being employed for decay, and more especially for teeth sensitive at their cervical portions. I know Dr. Stebbins well. I do not know when he first commenced its use, but I know that in many cases which he has presented, the decay seems to be arrested. There are many of the old practitioners who could give information upon such subjects as these, men from whom the best of us might learn, but who are debarred from giving the results of their long experience because they are without the degree of the schools, which is made essential to admission to some societies, and which they are too old to acquire. In their younger days there were no schools. These men ought to be with us now.

Dr. C. H. HARROUN: Dr. James Taylor and Dr. Jonathan Taft reported this remedy many years ago, and I have used it on their recommendation, and got happy results from it.

Dr. W. C. BARRETT: I can testify that I heard Dr. Taft present this subject at a meeting of the Michigan State Dental Society a number of years ago, and repeatedly at other times and places. He is not the man to keep a good thing to himself, and every one who knows him should be aware of this fact.

Dr. T. T. MOORE: Twenty odd years ago, Dr. Truman recommended nitrate of silver for sensitive dentine to the class in college of which I was a member.

Dr. PEIRCE: I do not remember the time when nitrate of silver was not used for sensitive dentine. I employed it for this purpose forty years ago. Dr. Buckingham once said that we should use the nitric acid and silver wire as perferable, thus getting it in its fresh state. But that was not for the purpose of arresting decay.

Dr. J. Y. CRAWFORD: There is no question in my mind that nitrate of silver has been used in treatment of diseases of the oral cavity ever since there has been a dental profession. The only question is, has it been employed therapeutically, or surgically?

Dr. A. W. HARLAN: The experiments of La Place, of Philadelphia, show that carbolic acid added to a solution of mercuric chloride will be absolutely reliable in the destruction of microbes. Dr. Black dissolves bichloride of mercury in peroxide of hydrogen. Europhen is an agent that is destined to take the place of iodoform. It is non-odorous and nonpoisonous. Tri-chlor-acetic acid is very useful for the solution of seruminal deposits on teeth. It is a stimulating astringent, and useful in pyorrhœa alveolaris. It makes an excellent refrigerant mouth-wash, in one-half to one per cent. in water. For dissolving the deposits on teeth, a ten per cent. solution should be used, this to be antidoted by an alkaline wash.

The report from Section IV. was called for —

HISTOLOGY AND MICROSCOPY.

The Chairman of the Section, Dr. Frank Abbott, said that he had no written report. He had been delayed in obtaining a camera, which he desired to use in illustrating the subjects chosen for presentation. He hoped that by its aid some obscure subjects could be satisfactorily cleared up. There was but one paper in the Section, and that was volunteered by Dr. C. W. Stainton.

[This paper was the presentation of a case in practice, which would require cuts for its comprehension.]

Adjourned.

THURSDAY EVENING'S SESSION.

A paper was read by Dr. J. D. Patterson, of Kansas City, entitled—

THE EFFECT UPON THE TISSUES OF THE ORAL CAVITY PRODUCED BY THE INTERNAL ADMINISTRATION OF CERTAIN DRUGS.

The dentist is almost daily brought into contact with certain diseased oral conditions, popularly believed to be the result of medication for certain systemic conditions. This belief has been fostered by physicians as well as dental practitioners, and has, therefore, become firmly fixed in the popular mind. Such remarks as these are frequent: "My teeth were perfect until my physician gave me medicine during sickness which salivated me;" or, "I have taken so much iron that it has decayed my teeth." Mercury and iron are the medicines which are generally supposed to work the greatest havoc with the oral tissues.

In small doses, administered for a short time, mercurial preparations are blood tonics. Soon, however, they provoke waste by stimulating the lymphatics, and if the small doses are continued, symptoms of so-called "hydrargyrism," commonly called "salivation," are exhibited. These are swollen or spongy gums, stomatitis, sore and loosened teeth, a metallic taste, with a blue line along the gums. In extreme cases, ulceration and sloughing occur.

About fifteen years ago, having been closely allied with physicians in the care of stomatitis resulting from mercurial poisoning, I began to doubt that the usual symptoms of ptyalism as found in the mouth were, *per se*, the results of mercury. Physicians differed widely about the blue line, that invariable first symptom of salivation, but they agreed that it was there, and always present. I had frequently seen it around gum margins, as the result of a deposit of calcific matter, which disappeared under the use of the scaler, and I became convinced that it had nothing to do with mercurialization. No physician was able to give a physiological reason for its appearance in connection with the exhibition ot mercury. I was successful in obliterating all traces of the blue line in every patient whom I found suffering from salivation.

Finding that this wasthe result of local conditions, I began to experiment upon the inflamed and spongy gums in salivated patients. I solicited such cases from physicians, and agreed to cure them without stopping the use of mercury. Under the careful removal of all irritant matter, and the institution of perfect hygienic measures and antiseptic conditions, all swelling and ulceration, save that which was clearly syphilitic, would disappear in a few days. These experiments were carried on for about two years, and I had a large number of patients sent me. The conclusion reached was that the blue line, and the spongy gums and other grave appearances, were the results of local conditions, and not of mercury. The tissues during mercurialization are predisposed to irritation, but that condition does not cause it. They need more care at such times, and they receive less.

Every practitioner must have observed all the symptoms of mercurialization when no mercury has been administered. Especially is this the case in syphilis. I have come to the conclusion that the blue line is solely and only caused by calcic deposits, and that the inflamed and spongy gums of ptyalism are from the same cause, added to which may be a lack of hygienic conditions. It would surely be a boon to all sufferers if it were known that careful treatment would prevent the destruction of the oral tissues, when it is desirable to continue the use of that prince of germicides, mercury.

DISCUSSION.

Dr. FILLEBROWN: Lead is supposed to cause the blue line upon the gums, but this is not always true. I know a case in which there has been the characteristic blue line for twenty years, without serious results.

Dr. E. C. KIRK: Mercurialization is a rare occurrence in these later years. I remember one case in which there was a dark line caused by the use of a charcoal tooth powder, which the patient had used during her whole life.

Dr. H. A. SMITH: In the few African mouths that I have observed, there is a dark line that is quite marked. Whenever I find that line I suspect the purity of the blood, if it is in the mouth of a supposed white person.

Dr. W. H. MORGAN: It is true that a blue line is characteristic of the African race. The negroes have a belief that the bite of a colored man with blue gums is poisonous. It frequently appears as a blotch upon the gums.

Dr. GEO. E. HUNT: While Dr. Patterson was reading his paper, it occurred to me that this blue line might be due to congestion, and if so it will be present wherever there is a low grade of inflammation. I do not think it is caused by mercurialization, but is a pigmentation accompanying congestion.

Dr. KIRK: I have never seen a case of mercurial ptyalism. Dr. Jack tells me that he has never seen one. Dr. Horton says that he has seen fifty. We would like to have him tell what are the symptoms.

Dr. BARRETT: Mercurialization is easily distinguished by the distinct metallic taste and the fetor accompanying it. I never saw fifty cases, but I have seen more than one. The color of the gums does not give a very clear diagnostic sign. Of course they are congested, and are apt, when, as is usual, they are very much swollen, to approach the purple of necrosis. The teeth become very sore and loose, and the tissues of the mouth ulcerate and slough away. The tongue becomes indented by the pressure of the teeth, because it is swollen. The flow of saliva is very profuse, and that secretion runs from the mouth in almost a constant stream. Some of the symptoms certainly cannot be caused by calcific deposits, or lack of care, and of these are the metallic taste, the peculiar fetor, and the great flow of saliva, which gives the name of salivation to the condition. There is, at times, in the mouths of patients who are in comparative health, a dark line that is a deposit upon the surface, and is easily rubbed off.

Dr. MORGAN: I was raised in a country where mercury was used very freely, and I formerly saw many cases of ptyalism; lately I have witnessed but few. I have seen exfoliations of the bone in mercurialized patients, and have removed such. I have seen extensive ulcerations. I have a patient now whose jaws are permanently closed as the result of salivation. I know a case in which 360 grains of calomel were given a patient in eight hours. First sixty grains, and then three doses of one hundred grains each, two hours apart. The symptoms were tenderness of the alveolus and gums, and looseness of the teeth. I have had within a short time two cases of ptyalism that occurred at the hands of homœopathic physicians. There is another symptom — the gums and the alveolus are very much absorbed. There is a stage of purple color in the gums, commencing at the free margins.

Dr. PATTERSON: I do not deny that there may be a changed condition in hydrargyrism, or mercurialization. The gums in health are pale.

The inflamed or spongy gum that is called ptyalism is usually, or always, due to congestion from local causes. I do not believe that the usual symptoms, as laid down in the books, are due to mercurialization.

Adjourned.

FRIDAY MORNING'S SESSION.

Dr. John B. Rich, Chairman of the Committee to which was referred the presentation to the Census Committee of the United States Senate of the views of the profession upon the offensive decision of Census Superintendent Porter, presented his report. Circulars had been sent to dentists, requiring them to make returns of the work done by them, and classing them with manufacturers. When protests were lodged with Superintendent Porter, claiming that dentists were professional men, and therefore not subject to such orders, the dentists were very harshly treated, and the heaviest penalties were threatened if they did not comply. The Committee thereupon sought an interview with the Senate Committee, and were courteously received.

Superintendent Porter was called in, and in their presence stipulated to withdraw the classification, and to place dentists among professional men, if they would not urge the legislation which had been prepared. This the Committee accepted, and the stipulation was reduced to writing and signed by Porter. Under this the dentists are not required to make returns, and the Committee urged that all who had filled out and forwarded to the Census Bureau the blanks which had been sent them, should write the proper office and demand the return of them. They would be fully justified in making this as a demand, and not a request.

The report was accepted, and upon motion Dr. John B. Rich was made a committee of one, on the part of the Association, to represent it in the matter before the Senate Committee and the Census Bureau.

The report of the Committee on State and Local Organizations was received and adopted.

The report of the Committee on Necrology was submitted and accepted. After the transaction of considerable business, every detail of which was exhaustively discussed by members of the Association whose voices are heard at no other time, the election of officers was reached.

It was determined that no meeting would be held next summer, except for the transaction of merely routine business.

Dr. EDWARD C. KIRK, from the Committee on State and Local Organizations, appointed in compliance with the suggestions contained in the President's Annual Address, reported a series of questions for consideration by local bodies. It was recommended that all societies select from the list one or more questions for consideration at their meetings, that papers be written upon them, and that they form the subjects for a discussion as exhaustive as circumstances will permit. The Secretary, or some appointed officer, should then make an abstract of the discussion, and transmit it to the Chairman of the Committee, Dr. Kirk, who will place it in the hands of the Chairman of the appropriate Section of the American Dental Association, for incorporation in the annual report.

If this plan be generally followed, it will result in placing before the profession of America the thoroughly digested opinions of the majority of the most intelligent dentists, and will result in great good for all. It will also tend to draw the Association into closer relations with the great body of dentists, and will have a wide influence in harmonizing and combining all into one grand body. At present there is no unity of purpose, but each state and local society acts independently, and without that coöperation which alone can produce the great results that are possible.

The questions submitted are as follows:

No. 1. Should Examining Boards have power to grant certificates of qualification to under-graduates?

No. 2. Should immediate root-filling be practiced while purulent conditions exist at the apex?

No. 3. What are the best materials to enter into the composition of temporary fillings, to be retained for a minimum of three years?

No. 4. What are the best methods for obtunding sensibility of the dentine by either local or general means? Should arsenic ever be used?

No. 5. What are the best forms of partial lower dentures, and the methods for constructing the same?

No. 6. Corrective dentistry—its present status; what are the simplest and most universally applicable forms of apparatus, and most efficient retaining fixtures?

No. 7. To what extent and under what conditions is the collar-crown a cause of pericemental inflammation?

No. 8. In cases of congested pulp, should the arsenical application be made without preliminary treatment?

No. 9. What are the advantages and disadvantages of the use of the matrix—*a*, with gold; *b*, with plastics?

No. 10. The etiology of pus-formation.

After the presentation of the final reports of the officers and committees, the Association adjourned to meet for the consideration of professional subjects two years hence.

THE DENTAL PRACTITIONER

AND ADVERTISER.

DR. W. C. BARRETT, ... EDITOR.

BUFFALO, N. Y., OCTOBER, 1892.

THE FUNCTION OF THE SCHOOLS.

We frequently hear the charge urged that dental schools are engaged in making scientific men, and not dentists; that they teach too much of theory and too little of practice. Instances are cited of graduates who were unable to insert as good a filling as some practitioners who had never attended a college. These criticisms are almost invariably made by illiterate men, who affect to despise book knowledge, and who claim that they themselves, all unlettered as they are, can teach a student more of dentistry than any school in the land.

When such an imputation is made, it is well to inquire what is understood by dentistry. If it be the extraction of teeth and the insertion of cheap rubber substitutes, robbing the people of the organs supplied by nature that fees may be charged for the frightful caricatures of the shop, there may be a modicum of truth in these assertions. That was the dentistry of a half-century ago. The practice of to-day is a very different thing. The schools teach that the first duty of the dentist is to save teeth, and this demands a knowledge of something more than extraction. The practitioner of to-day must be competent to treat all forms of oral disease, and this requires a knowledge of physiology, of pathology and therapeutics. The man who knows nothing but the making of false teeth, is no more worthy the name of dentist than is the man who makes wooden legs entitled to the name of surgeon. Even the ability to insert a thoroughly compacted gold filling does not make a dentist. He may have attained to the highest point in manipulative ability, and yet be nothing more than a mechanic. There is altogether too much of this judging of a man's professional standing by his mere skill in technics. Something more is demanded for a really professional man.

Not infrequently do we hear it said that Dr. A. is an excellent dentist, because he has the ability to make a beautiful artificial denture, when he knows nothing of the broad principles upon which a really intelligent practice is founded. Or Dr. B. may have won a great reputation as a professional man, because he can with a mallet hammer gold into a cavity in a tooth, and so finish it as to make a fine artistic display. We do not mean to undervalue or depreciate these accomplishments. They are essential to a thorough dentist, but they are far from being the only qualifications needed. Indeed, they are not the first requisites. A beautiful and substantial filling may be inserted in a tooth that was in no condition to receive it, and it may be but an injury instead of a benefit.

The education of the dentist should not begin in either the laboratory or the operating room. Before the student is prepared to commence operations in the mouth, he should be taught the underlying principles upon which a true practice must be founded. He must learn what is disease, and the steps necessary to secure a return to health. To put even the finest filling into a diseased tooth, perhaps over a dead and putrefying pulp, is not dentistry. To insert even the most beautiful artificial plate over tissues that are in an inflamed and sloughing condition, is not good practice. The dentist who is worthy the name of professional man, must be able to diagnose disease of any of the tissues of the oral cavity before it is too late for cure. He should recognize inflammation of the osseous structure in advance of necrosis, and be able to use the proper remedies, both local and general, before a resort to surgical means becomes a necessity.

There is among dentists a great misconception of what is truly practical. As has been very wisely said, all true practice must be founded upon true science. There must first be a comprehension of what is physiological law, before one is fitted to deal with pathological cases. This world is not ruled by mere chance. It is governed by immutable, unchangeable principles, whether it be in its diurnal revolutions and the succession of the seasons, or in the evolution of a blade of grass. All function is the result of certain fixed regulations, and all disease is the result of violation of these physical statutes.

He who comprehends law and the principles upon which it is founded, is the only really practical man. If he be consistent, he is intensely practical, and is impatient with error and falsehood because they are not practical. He loves science because it is the only gateway to really practical achievements. He knows that he cannot really be practical unless he is first scientific, for all practical things must rest on a scientific basis. Science is law, and without it there can be nothing practical, or really practicable. Hence the scientific man alone is really practical. Many enjoy rhetorical flourishes in speeches and writings, but an ounce of logic is worth a ton of rhetoric, and all really learned men despise mere verbiage, and stick to the realm of the practical.

Dental students must remember, then, that their education should begin with the study of the laws which govern all practice, that they may comprehend what is necessary to be done, and then proceed in the only really practical way; that which is in conformity with law. The principles which dominate practice once fairly mastered, the technical skill properly to perform operations is easily acquired, and must largely be obtained in daily practice after graduation at the schools.

ANOTHER GREAT DISCOVERY.

The illiteracy of the wonderful originators of new anæsthetics, and the "inventors" of novel therapeutic qualities in drugs, is notorious. In the last number of this Journal, Dr. Low showed us some of them. Another comes to the front from the neighborhood of Pittsburgh, which seems to be a truly "inventive" center. This new, "improved" anæsthetic is presented in the usual ungrammatical way. It is vaunted by a number of men who sign "M. D." after their names. What kind of a physician must he be who writes like this: "I have had a number of patients whom I considered it dangerous to take chloroform." Another says of laughing gas and "vitalized air," "I never consider them safe in any case. Use Richard's anæsthetic, know you are safe, and be happy." Still another M. D. says, "I have had personel experience as well as my wife, with Dr. Richard's local anæsthetic." If he has had both his wife and personal experience, he must be a wise physician indeed.

Here is the kind of ethics which the use of this incomparable remedy encourages. One dentist writes, "I am doing up my competitors in great shape. What will you sell me the exclusive right of this county for?" Another says, "I have extracted *thirty teeth* with it to-day." Another, "Dr. Richard pulled *eleven* teeth for me, and it was more of a jollification than an operation." One dentist writes, "Do not let any other dentist of this place have the preparation without consulting me." Another says, "What price will you sell me the exclusive right of this county?" while another feels jubilant because "the time is soon coming when the professional and scoffers must bow to its shrine." And these are all *professional men*, and doubtless are the first to claim fraternity with those who observe the decencies of professional life. One can scarcely forbear quoting the scathing words of Constance to the Archduke of Austria—

> "Thou wear a lion's hide! Doff it for shame,
> And hang a calf's-skin on those recreant limbs."

THE DENTAL LAW OF THE STATE OF NEW YORK.

On the twelfth day of May, 1892, the Governor of the State of New York signed an Act to amend the previous dental Acts, which in effect codifies the old laws, and regulates anew the practice of dentistry. Many inquiries concerning the provisions of the new law have been made, and there is some lack of comprehension of its full meaning. We have, therefore, thought it best to present a synopsis, with a brief history of legislation in the State.

At a meeting of the Western New York Dental Society, held in Buffalo, May, 1867, the subject of Dental Legislation was first presented in this State, by Dr. B. T. Whitney, and a committee, of which Dr. Whitney was the chairman, was appointed to consider the matter. At the October meeting of the same Society, the present writer, as the Secretary of that Society, was directed to enter into correspondence with representatives of all the organizations in the State, with a view to secure unity of action in bringing about the formation of a State Society, through the necessary legislation. This was done under the direction of the President of the Society, Dr. Whitney, in whose brain the scheme had birth. Finally a convention was held in Utica, December 17, 1867, at which a committee consisting of Drs. A. Wescott, of Syracuse, B. T. Whitney, of Buffalo, and L. W. Rogers, of Utica, was appointed to present a bill to the legislature.

The first enactment was signed by the Governor, April 7, 1868. It incorporated the State Dental Society, and defined the qualifications of a legal practitioner. It provided for the examination of a qualified person by the Censors of the State Society, and for the issuing of a simple diploma, plainly stating who should be considered eligible to such examination, but there was no penalty attached, nor any mandatory enactment whatever. The only discrimination among dentists was as to the privileges of this examination. The public sentiment would not at that time warrant the exclusion of any man from dental practice, no matter how ignorant he might be. But one of the expressed objects of the law was to educate the people up to the acceptance of legislation prohibiting the unqualified from practice. Every one engaged in promoting that law understood that amendments would be asked for, whenever in the judgment of the members public sentiment would sustain them.

In April, 1870, an amendment was procured, establishing the degree of Master of Dental Surgery, (M. D. S.), and authorizing the State Society to confer it upon recommendation, and after examination by its Board of Censors. This was made the highest legal qualification of the State.

The first prohibitory law was passed June 20, 1879, and made it unlawful for any person to practice dentistry for fee or reward in the State, unless he had the diploma of the State Society, or that of some reputable medical or dental college, recognized as such by said Society. The law also provided for the registration of all dentists in the County Clerk's office of the county in which they resided, and provided for a fine of not less than fifty nor more than two hundred dollars, for each infraction. The time given for registry was sixty days from the passage of the law.

At the next session of the legislature, a bill was passed re-opening the registry, and giving another term of sixty days for registration.

Another amendment was signed by the Governor, May 10, 1888, providing for the registration of all persons entering upon practice, and requiring the certificate of the Censor of the district in which he resided that the qualification under which he sought to register was a valid one, and the diploma one from an institution recognized as reputable by the Dental Society of the State. This Act provided that all agents or employés should register in due accordance with it.

Finally, the present enactment was secured and approved by the Governor, May 12, 1892, and is now in legal force.

Section I. provides that no person shall practice dentistry, either as principal, agent, assistant or employé, who shall not be licensed and registered under this Act. The penalty is, for the first violation a fine of not less than fifty dollars ; for every subsequent conviction, a fine of not less than one hundred dollars, or imprisonment, or both fine and imprisonment.

Sec. II. states what are the qualifications demanded, which are a diploma granted either by the State Dental Society, or by an incorporated medical or dental college, approved by the Dental Society of the State of New York, and proper registration under the Act.

Sec. III. provides for the registration, which must be upon production of a certificate from the Censor of the district in which he resides, that the applicant is a proper person to be registered, and that he possesses the necessary qualifying diploma. It provides against the sale or barter of a diploma, or the altering or changing of it, or the substitution of any name for that originally inscribed in it. It forbids the use of the title of Doctor of Dental Surgery, or Master of Dental Surgery, or any letters implying such title, unless the degree is actually possessed by the user thereof. All fines and forfeitures go to the State Dental Society for the payment of expenses.

Sec. IX. provides that the State Society may determine what schools maintain a course of training and education sufficient to enable the Censors to accept their diplomas as sufficient qualification for registration. It also prescribes who shall be admitted to the State Censors' examinations for the degree of M. D. S., which shall be: First; All duly licensed and registered dentists of the State. Second; Persons from other States or countries who present proofs of having been in lawful practice without the State for six years. Third; Students who shall have studied dentistry for a term of four years, with some reputable, duly licensed and registered dentist of this State.

It further provides that every student engaged in the study of dentistry at the time of the passage of this Act, shall file with the Secretary of the State Dental Society a statement of the fact, and every student commencing the study of dentistry hereafter shall do the same, paying therefor the sum of five dollars. Until such certificate be filed, the requisite term of four years to entitle him to examination by the Board of Censors shall not be deemed to have commenced.

Sec. X. regulates the fees, which are: Students certificate, five dollars; Censors certificate for registration, ten dollars; Examination for the degree of M. D. S., thirty dollars. None of these fees are returnable.

No person shall be punished for merely mechanical work as an assistant. No registered dental student shall be punished for work done under the direction of his preceptor. Nothing in the Act shall be construed as suspending or discontinuing any prosecutions already begun under the old legislation.

The principal misunderstanding of the new law seems to be concerning the registration of students. In this respect the phraseology is not at all clear, and there seems to be conflicting provisions. But a careful study of the whole Act makes plain the intent of the framers, and in this view it seems to us it must be interpreted.

There are two doors open for entrance upon practice. One is the possession of the regular degree of a recognized medical or dental college. The term of pupilage and the course of study for the obtaining of this qualification is, and must be, prescribed by the schools themselves.

The other entrance into dentistry in the State of New York is by obtaining the diploma of the State Society, and the terms on which this is granted are stated in the law itself. They are, a period of pupilage of four years, or a term of practice of six years, and the ability to pass the examination of the Board of Censors. The requirement that the pupil shall register and pay the necessary fee at the commencement of the term of pupilage is to prevent fraud, and for this purpose alone. If a dentist has the regular diploma of the schools, he is eligible to the degree upon examination, as being already a legal practitioner. The term of six years of legal practice outside the State, is to provide for the examination of dentists from States which have no restrictions requiring a diploma of the schools.

The plain intent of the law is, then, to provide a method for entering practice without attendance upon a dental or medical college, and the registration of students is only for such as propose to enter dentistry through that gate. Students who intend entering by the way of a dental or medical college, do not need to register with the Secretary of the State Dental Society. They may obtain their degree, and are then entitled to the privilege for which the four years privilege with a preceptor is required.

It is but fair to say, that although the State Society apparently opens that door, it is more apparent than real. Practically, the Board of Censors will pass no student who has not obtained his college degree, even though he should have served a term of twice four years under a preceptor. In fact, the standard is so placed that none but graduates of the schools will hereafter receive the degree of Master of Dental Surgery. The examination is practically prohibitive to all others, the Society, through its Board of Censors, specifically stating that their object is to force all students to attend a college. There is, then, no necessity for the registration with the Secretary of the State Society of any student who proposes to attend either a dental or medical college.

POPULAR DENTAL ERRORS.

It would seem that when once an impression concerning a medical or dental fact gets hold of the public mind, it is almost impossible to eradicate it, no matter how absurd it may be. For instance, there is a fancy in the unschooled brain, whether in or out of dentistry, that tincture of myrrh is a kind of panacea for all oral troubles, and so it is used empirically by every professional and unprofessional old woman in the land. Heaven only knows the why or the wherefore of this, for it has no therapeutical properties that should commend it, but it is supposed to be "healing"—whatever that may mean.

It is impossible to get it out of the heads of dentists who know nothing of the facts, that when men lived in what is called "a state of nature," they did not have caries of the teeth. Periodically one runs across the assertion that the native Indians, or Africans, or Esquimaux, or some other aboriginal people, were never troubled with bad teeth, whereas the truth is that there never was a race existent upon the earth whose teeth did not decay. Some nationalities have had better teeth than others, but the difference has not been a very marked one. All have been subject to the same general dental disturbances, and if Adam was the first of his species, there is no doubt that Eve had to make poultices, and sit up nights to heat flat-irons and flannel cloths for the cure of his toothache.

There is a prevalent idea that filled teeth have been found in the mouths of Egyptian mummies. It is true that Herodotus says there were "physicians for the teeth" among the Egyptians of his day, but there is no evidence that they attempted the salvation of teeth by filling. No such instance has ever been presented. Artificial substitutes have been found, which were usually human teeth held in place by means of gold wires or bands, and extraction and cleaning of the teeth were done, but that plugging as a phrophylactic measure was ever a practice, there is no proof to establish.

When but a boy, we remember reading that glass could be cut under water with a pair of scissors or shears, and the recollection of testing the matter repeatedly, without the slightest success, is very vivid in memory yet. Even now, that same absured paragraph periodically goes the rounds of the press, uncontradicted. It is but a short time since we read it in a dental journal. Try it, some of you credulous readers, and get your fingers cut with the splinters as we have, and then you will be convinced.

Not long since the readers of a certain dental journal were informed that the manufacture of false teeth for horses was a new industry in France. It was said that a company with 2,000,000 francs capital had embarked in the enterprise. The one who invented that piece of absurdity must have had an unlimited idea of the credulity of mankind, but surely he never could have imagined that a dental journal would have placed faith in it. Dentists are supposed to have expert knowledge, but the editor who gravely inserted that preposterous statement must have thought them utterly without common sense.

How regularly does one come across the account of the person with a live snake or lizard in his stomach, which has lived there for years. Circumstantial accounts of the ejection of some reptile are published, with perhaps the certificate of a doctor or clergyman that it was an actual fact. Almost invariably the explanation is given that it was supposed to have been swallowed when the man drank at some spring or stream in the dark. Of course such a thing is utterly impossible. To say nothing of the absurdity of the animal's being subjected to the action of the gastric juice without harm, how could air-breathing animals exist in the human stomach in which there is no air, and which is so frequently filled with a gas that must be fatal to any animal with lungs? Certain of the entozoa exist within the cavities of the body, but they are not air-breathing, and are parasitic in their character.

Not long since, the assertion appeared in a respectable medical journal, that if castor oil be applied to warts once a day for from two to six weeks, they would be removed, irrespective of their size. Castor oil is excellent for moving the bowels, but the attempt to move a wart with it would have to be supplemented with a large endowment of that faith which is said to remove mountains, if it would be successful.

But if one were to make a collection of absurd quack remedies that have been presented by respectable authority, and with the sanction of the clergy and the newspapers, he would need something more than the pages of a periodical, though it should contain nothing else for a whole volume.

Perhaps the most preposterous dental yarn ever devised, was that which is contained in the following very specific account taken from a dental journal, and written by one of its numerous editors. The story of the girl who commenced lifting her barnyard pet when it was but a little calf, and continuing to do so every day, was enabled by the practice to do the same when it had grown into a great cow, sounds very mild in comparison. Just imagine one extracting, with the unaided fingers, the short and solid teeth, with the great spreading roots, often found in the mouths of Irish and Italian peasants. Sure enough. Why *don't* our colleges teach these methods?

"FINGERS VS. FORCEPS."

"Many nervous persons experience at the mere mention of tooth extraction an unpleasant sensation akin to pain, but the strongest will wince whenever they see the instrument that is going to do the work.

"Why don't our colleges institute a mode of instruction like to the one followed in Japan? There the dentist extracts every tooth, be it upper or lower, incisor or molar, without the use of an instrument, his fingers having been trained to take the part of forceps. It may seem incredulous, but it is nevertheless a fact, that the Japanese dentist is more proficient in this particular branch of our art than his European or American brethren, and here is the way he arrives at his proficiency.

"In a board of soft wood holes are drilled, and in these holes pegs are inserted loosely. The board is laid on the floor, and the apprentice tries to pull out every peg perpendicularly, without in the least disturbing the position of the board, using the thumb and forefinger of his right hand. Able to do this, the pegs are inserted tighter, his thumb and forefinger gaining strength and dexterity in manipulation as he keeps on practicing. Having perfected himself at the pine board, an oak board is substituted, the oak pegs being driven in tightly. There he practices for weeks and months, till finally the oak pegs succumb to the skill and power of his fingers. The third and last term comprises the extracting of maple pegs very tightly fastened into a maple block. Passing the required examination at this block, he is graduated, and sent forth to try and pull 'human pegs.'

"There we see him take a position similar to one we would assume, holding the jaw and keeping the mouth open with his left hand, whilst with the two fingers of his right, he passes into the mouth and extracts, if necessary, five to seven teeth in a minute."

DR. W. H. DWINELLE.

There is not an dentist in America who will not sigh with regret when he learns that the active days of usefulness of Dr. Dwinelle, of New York, are over. He has retired to his early home in Cazenovia, there to spend the last years of a long and honorable life in the quiet retirement of a country home. What adds another pang to the general sorrow, is the knowledge that he is but inadequately supplied with money for his old age. He has always given as freely as he has received, and spent time and money lavishly in the service of the profession which he has so honored, and to which he has been so devoted. A few years ago, an unfortunate speculation swept away that which he had accumulated, and Dr. Dwinelle was left without sufficient provision for his old age.

We are not violating any of the rules of decorum in making these facts known, for it is through no misdeeds of his own that Dr. Dwinelle has met these misfortunes. Had he been of a selfish, grasping, avaricious nature, he might have been a rich man to-day, for the opportunities have been his to accumulate, had he not loved his profession and his professional brethren better than he loved himself. There are those occupying prominent positions to-day, who use those places for their own selfish ends. Dr. Dwinelle never did this, and his present poverty is a thousand times more honorable to him than would be the riches which have been attained by men who sacrificed others to their own advancement.

There is not a dentist in America who is not in debt to Dr. Dwinelle. There is not one who is not reaping the benefits of his public professional labors — who has not directly profited by that which was the result of Dr. Dwinelle's earnest study and self-sacrificing devotion to his profession. If he could receive but a tithe of this, his old age would be surrounded by everything that he could wish. Will not the dentists of New York State, especially, remember him now when his days of usefulness are numbered? At the very least, they can drop him a letter of sympathy and appreciation, to warm the heart which was never cold to any brother dentist's appeal. If they will enclose something a little more substantial, it will not be taken amiss. It is not charity. Let it be a token of goodwill and affectionate remembrance to one whose career has been honorable to himself and serviceable to his brother practitioners. How many will remember Dr. Dwinelle when the glad Thanksgiving Day shall come, and testify their gratitude and sympathy to one whose sympathies never yet slumbered when dentists or dentistry were concerned? He may be addressed at Cazenovia, N. Y., or if any one desires to unite with his brother dentists in doing something to smooth the declining years of the honored old veteran, let him address Dr. S. G. Perry, 46 West 37th street, New York City.

THE HONORARY DEGREE.

There is a considerable difference of opinion concerning the propriety of conferring upon men who have long been engaged in reputable practice, or who have distinguished themselves in the service of their profession, the honorary degree of Doctor of Dental Surgery. This has always been done, and there has never been any legislation against it. The schools which belong to the National Association of College Faculties, three years ago passed a resolution that colleges belonging to that Association should not confer it, except by consent of the Association. Certainly, this is a sufficient safeguard against its improper use.

But there is a considerable proportion of the members of the profession who demand even more than this. They urge that it has been freely conferred in the past, and there is no complaint that it has ever been abused by any respectable school. There is not a school in existence that has not connected with it more or less men who hold this honorary degree, and in some of the colleges they form a large proportion of the teachers. There has never been any complaint concerning their efficiency. Some of the most eminent men in dentistry possess the honorary degree, and were it not for this they would be without such qualification altogether.

The attempt to throw discredit upon these diplomas is a direct affront to some of the foremost men in the profession, and the refusal further to acknowledge these diplomas, or the positive.refusal further to grant them under the proper restrictions, would result in a deplorable division in our ranks. Such diplomas have always been conferred as marks of distinguished honor, not only in dentistry, but in all professional walks of life, and their existence is not only now acknowledged, but it always has been.

Such are some of the arguments advanced. At a late meeting, the Connecticut Valley Dental Society, one of the oldest and most respected of such organizations, appointed a committee to take the subject into consideration. This committee presented a report, which upon motion was unanimously adopted. It will be seen that it demands something more than the conferring of a degree as a mark of honor. It claims it as a right, under certain conditions. The following is the report:

The Connecticut Valley Dental Society, at its annual meeting, June, 1892, appointed a committee to present to the dental faculty of the University of ——— a petition for conferring the honorary degree of Doctor of Dental Surgery, on such worthy practitioners of dentistry as were in practice previous to 1860, and who still continue in active practice.

The colleges of this country are united in their demand that a uniform course of training and study must be complied with, before the degree of D. D. S. can be conferred upon a dental student. Many of the State and local societies are restricting their membership to those holding either a dental or medical degree, thus barring out many practitioners who have labored for years to make for dentistry a name to be honored.

The laws of the different States regulating the practice of dentistry, give to these men as good a standing in the community as those holding either the M. D. or D. D. S., while their general qualifications and superior ability in every department give to them a moral right to the title of Doctor, greater than many who hold the college title. The future of American dentistry through college instruction and the judicious enforcement of existing State laws, is carefully guarded. The limit line has been drawn, and is now well understood.

The great universities and colleges of our country yearly confer many different honorary degrees. They are unbought, unsought, often unexpected, and rarely are they undeserved. The recipients are men who have earned the honor by years of devoted labor in special callings. Surely, we have many such worthy men of over thirty years' active practice in dentistry. As members of a so-called profession, are we asking too much in demanding that these veterans may be given an honorary degree, and that the dental departments of our Universities and Colleges should fall into line with other educational institutions, and judiciously confer such honors.

James McManus, D. D. S.,
N. Morgan, D. D. S.,
G. H. Maxfield, D. D. S.,
Committee.

THE MEETING AT NIAGARA.

The thirty-second annual meeting of the American Dental Association at Niagara was not an unqualified success. There was a fair, though not a large attendance, but the papers were not numerous, and with a very few exceptions were unimportant, while the discussions as a whole were puerile and unworthy such a National Society. Year by year it becomes more and more apparent that some change in the conduct of the Society is loudly demanded, if it is to take any high scientific rank. The annual reunion of professional friends is very pleasant, and the business matters of the profession are well looked after. But something else is demanded. The Society should have a more representative character. Its papers and discussions should be sufficiently erudite to command the attention of the world. Questions in dental science should be examined from a broad standpoint, and the decisions of the Society should carry with them a weight that should cause them to be respected. Matters of mere technique should be relegated to local organizations, and clinics, unless some entirely new principle or an especially original device is to be demonstrated, should be forbidden.

The Sections as now organized are valueless and ineffectual. There are not enough intelligent men exhaustively to discuss any scientific subject, when all the members are together. There never has been any attempt at digestion of important papers in the Sections preliminary to the general meeting, and that is the only possible function of Sections, and the only excuse for dividing the Society.

Then, too, business constantly interrupts the debates, and hence no subject is adequately discussed. There should be separate sessions held for the despatch of business, or it should all be placed in the hands of the Executive Committee.

There is no knowledge of what subjects will be presented for consideration until the reports from the Section Committees are offered, and then it is too late for preparation. Some provision should be made for a preliminary publication of abstracts of important papers, which should be sent to the members in advance of the meeting.

A Committee was appointed last year to take these defects into consideration, and at considerable labor and expense they had prepared a report which had been printed and widely circulated. But at the meeting this year, which was noted for the paucity of papers and the meagerness of debates, no time could be found by the Executive Committee for its consideration, and it was postponed until next year, when there will be no meeting except by the managers, and the body of the profession will have no chance to pass upon it.

INFLUENCE OF HEREDITY.

The Medical Record gives an account of a series of experiments undertaken by Dr. C. G. Lockwood, of New York, to determine the power of transmission of mutilations in animals. White mice were selected, because they begin to breed when but thirty days old. They were bred "in and in" for ninety-six generations, all the sickly and defective ones being killed. Pursuing this course, notwithstanding the close breeding, at the end of that time the animals were larger and finer than the first ones.

The tails of the original pair were cut off. When they had young, a strong pair of these were selected, their tails cut off, and they were put in a cage by themselves. A pair of their progeny were selected, and the same course pursued. Thus in each instance brother and sister were the ones chosen for parents of the next litter, and in every case their tails were clipped. In seven generations young mice began to appear without tails, and he finally produced a perfect breed of tailless mice.

He then commenced the reverse process, by crossing a mouse without and one with a tail, alternating the sexes of each generation, and finally he got a breed of full-tailed mice again. Thus a persistence in removing the tails, and continued in-breeding of the same families, produced mice without tails; but when these were crossed with mice of the same origin, but possessing tails, there was a return to the ancestral condition, the hereditary tendency toward mice with tails being much the stronger.

Many experiments have been tried to determine the force of transmission of parental peculiarities. All experience teaches that bodily and mental traits are inherited. All breeders of animals know that it is possible materially to vary a type by judicious crossing and persistent in-breeding. But the permanence of such variation is a matter of speculation. If all horses were allowed to run wild, there is little doubt that the race horse and the cart horse would soon lose their distinctive traits, and there would be a tendency toward the original type. So, if all dogs were withdrawn from man's dominion and care, there would be a universal degeneration toward their wolfish ancestral traits. There are few who do not admit that varieties and species may have been produced by peculiar environments, and that the long continued disuse or destruction of any organ will finally result in its disappearance. Yet there are some stubborn facts which refuse to conform to the supposed general rule, and among these none is more striking than the persistence of the hymen, notwithstanding its long continued obliteration.

MAL-OCCLUSION OF ARTIFICIAL MOLAR TEETH.

Sometimes dentists find a great deal of difficulty in properly articulating artificial teeth. When the denture is completed, it is found that the molars strike too quickly, while the anterior teeth do not occlude at all. It becomes necessary to grind off the molars until the cusps are entirely removed, and a disagreeably smooth surface, unfit for mastication, is the result. Often, too, there is an annoying "click" when the teeth are brought together.

Usually this is the result, either of crowding the anterior portion of the wax articulating model beyond the point at which it rested when the bite was complete, or of allowing the posterior portion to rise, either of which will make the plaster casts of the occluding molars too short. The "clicking" is due to imperfect occlusion.

The undue length of the molar teeth may be, in some instances, owing to other causes, such as an improperly proportioned articulation, or to the springing of the posterior portions of the plate when a rubber base is used, but the most common cause is that first quoted.

Many a perfect fitting plate has been made almost useless by presenting two inclined planes upon occluding teeth. It is loosened by sliding backward or forward down this inclined surface, while perfect mastication is effectually prevented. More dentures fail by reason of bad occlusion, than through a poor fit.

BIBLIOGRAPHICAL.

BOOK ON THE PHYSICIAN HIMSELF, AND THINGS THAT CONCERN HIS REPUTATION AND SUCCESS. By D. W. Cathell, M. D. New Tenth Edition (author's last revision.) Thoroughly revised, enlarged, and rewritten. In one handsome royal octavo volume. 348 pages. Bound in extra cloth. Price, post-paid, $2.00, net. Philadelphia: The F. A. Davis Co., Publishers, 1231 Filbert Street.

Some years ago, in reviewing an earlier edition of this work in *The Independent Practitioner*, we said — "There are a thousand things that are requisite to the successful physician. Many a man of good general scholarship and great professional knowledge has seen himself distanced in the race of life, simply because he lacked the practical knowledge, the worldly wisdom, the professional tact, the ethical information which it is the object of this book to inculcate." There is not a young physician graduated who might not sensibly shorten the term necessary to build up a practice, there is not an old practitioner who might not materially add to the sum derived from his practice, by a careful study and a practical application of the advice and information which this book contains.

And what is true of the physician is almost equally so of the dentist, for their practices are not dissimilar. The value of the work is indicated by its popularity. This is the tenth edition, and the sales were never more active. It ought to be a text-book in every medical school in the land.

A TREATISE ON DENTAL JURISPRUDENCE, FOR DENTISTS AND LAWYERS. By William H. Rehfuss, D. D. S. Philadelphia: The Wilmington Dental Manufacturing Co., 1892.

Perhaps there is not so great necessity for a comprehension of the legal aspects of dental as of medical practice. It is well known that there is a class of lawyers who maintain a disreputable existence by fomenting strife and stirring up litigation among people who would otherwise remain at peace. No class of men afford these shysters so great opportunities for the exercise of their nefarious qualities as physicians. It is impossible that they should secure the same good results in every case, and it is easy to make a credulous patient believe that it is the doctor's fault. We have had personal knowledge of a great many cases of suit for malpractice, and among them all there was not one in which the trouble had not been stimulated and encouraged, if not originally instigated, by some conscienceless lawyer. A fair knowledge of jurisprudence would have enabled the physician to avoid the liability to a possible penalty, by taking proper precaution.

Dentistry presents the same liabilities to suits for malpractice that medicine does. With the increased consideration which it receives year by year, and with the bettered social and pecuniary condition of its practitioners, they will become in due time the prey of these speculative lawyers. They should, then, acquaint themselves with their liabilities, and learn just where these professional beasts of prey lurk, and the book under consideration affords precisely that knowledge.

So important has the subject become, that the Dental Department of the University of Buffalo has added to its Faculty a teacher of Dental Jurisprudence, in the person of one of the most brilliant of the lawyers of that city, a professor in the Law School connected with the University, and this book will be made the text-book connected with that chair. More we could not say in its favor.

The book also contains a digest of the dental laws of such of the States and foreign countries as have secured such legislation, and this feature alone is worth the price of the whole.

FIVE HUNDRED AND SIXTY-SEVEN USEFUL HINTS FOR THE BUSY DENTIST. By Wm. H. Steele, D. D. S. Philadelphia: The Wilmington Dental Manufacturing Co.

The Wilmington Dental Manufacturing Company is fast assuming an important place among the publishers of dental books. So far, those which it has issued have been of a high character, and the letter-press and binding has been creditable to them. This latest issue from their press can scarcely be called a scientific book, nor is there anything startlingly original in it. It does not pretend to anything of the kind. It is a compilation, mainly from journalistic sources, of whatever struck the fancy of the compiler as likely to be useful in an every-day dental practice.

It is divided into five departments, the first of which contains excerpts, recipes and selections having reference to the operating room, the second to the laboratory, the third to crown and bridge work, the fourth to dental medicine and dental preparations, and the fifth to rather general information. The book may be obtained through the dental depots, or by addressing the publishers. pp. 295. Price $2.50.

TRANSACTIONS OF THE TENTH INTERNATIONAL MEDICAL CONGRESS. Held in Berlin, Germany, August 4–10, 1890.

Volumes Three and Four have finally been received through the Smithsonian Institute at Washington. There can be no possible excuse for this tardiness. Two years have elapsed since the close of the meeting, and now the Publishing Committee have not even the apology of numerous illustrations which were to be prepared, for the books are as bare as so many volumes of sermons.

CURRENT NEWS AND EXCERPTS.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The Association of Dental Colleges has brought about some important reforms. Previous to its organization, all seemed to be engaged in a general struggle for students, with a consequent continual lowering of the standard. When the representatives of the schools were brought together, it was found that all were desirous of doing better work, and each was ready to take higher ground when it was demonstrated that he would be supported by concerted action. Since that time, wonderful advances have been made, and the dental college of to-day would scarcely be recognized by the graduate of even a decade ago.

Strange to say, the prosperity of the schools has more than kept pace with the raising of the requirements. It was anticipated that with the extension of the obligatory term to three years, there would be a falling off in attendance, but this has not proved to be the case. Nor has the increase in the number of the schools worked the ruin to those already in existence that the croakers prophesied. Never were there so many in attendance at the older schools as now. The number has doubled within a short time, and still the classes grow, and still they must continue to grow for some time to come.

Twenty-six schools were represented at the late meeting. Harmony prevailed generally, and there was a universal desire to make still further advances. Three new schools made application for membership. They were: The United States Dental College, of Chicago; the Homœopathic Hospital College, of Cleveland; and Detroit College, of Detroit.

The application of the Western Dental College, of Kansas City, and the Dental Department of Howard University, of Washington, were laid over for another year. That of the Dental Department of Tennessee Medical College, at Knoxville, was rejected.

Baltimore Dental College was censured for conferring an honorary degree *in absentia.*

The proposition to increase the length of the obligatory session from five months to seven was defeated, as was the one to increase the term to four years. Both of these must probably come in time.

The resolution providing that graduates in pharmacy should be entitled to enter the second or junior class, was also defeated.

A resolution was offered by Dr. Truman, as follows: *Resolved,* "That the degree of Doctor of Dental Surgery shall not be conferred honorarily by any college belonging to this Association."

This was defeated by the decisive vote of 15 to 9, the members entertaining the opinion that the present restrictions were a sufficient safeguard, and not desiring to abolish the custom of granting honorary degrees altogether.

It was recommended that all who had complied with the requirements of the Census Bureau, in making returns as manufacturers, should write the superintendent demanding a return of such reports, as under an agreement made, dentists were to be considered as professional men and not classed as manufacturers.

The officers elected for the ensuing year were —

President, J. D. Patterson, Kansas City.
Vice-President, H. A. Smith, Cincinnati.
Secretary, J. E. Cravens, Indianapolis.
Treasurer, H. A. Smith, Cincinnati.
Executive Com., J. Taft, Ann Arbor,
F. Abbott, New York,
A. O. Hunt, Iowa City.

POST-GRADUATE DENTAL ASSOCIATION.

This body is quietly doing a very important work in dentistry, by organizing practitioners and students into reading and study classes, upon the Chautauqua plan. There are pre-graduate and post-graduate courses, the one designed for the non-graduate, and the other for the graduate. Dr. R. B. Tuller is the President, and Dr. Louis Ottofy, Manager of the Association. Both are residents of Chicago, and both are enthusiastic and persevering workers. There is also an Educational Council, composed of twenty gentlemen well known in dentistry, and under their direction the courses are conducted. Five classes have been organized, and every dentist who desires professional advancement for himself should join one of them. Full information may be obtained by addressing Dr. Louis Ottofy, 1220 Masonic Temple, Chicago.

The classes already in working condition are as follows:

Class A. Two years' course. Composed of practicing dentists and students, or those who desire strictly practical instruction, who have never attended a regular course of lectures, or a practitioners' course at a dental college, but who eventually expect to attend a dental college, and of those practitioners not mentioned in the succeeding courses. At the close of the term the successful candidate receives a certificate of proficiency.

Class B. Three years' course. Composed of practitioners whose aim is not future attendance at a dental college, on account of age, permanence of location, lack of means, or any other cause, but who are desirous of improving themselves and of giving the best service to their patients. This is a combined scientific and practical course. On its successful completion, the candidate will receive a certificate of excellence.

Class C. Four years' course. Composed of practitioners who are graduates of dental or medical colleges in regular or special courses, or who have attended a practitioners' course. This is a combined course, comprising dental science and practice and the study of collateral sciences. On completion, and the successful passing of a thorough examination, the successful candidate becomes a member of the Post-Graduate Dental Association, and receives the degree of Fellow of Dental Science.

Class D. Five years' course. Composed of regular graduates of dental and medical colleges of not less than five years' standing, and of non-graduates who (1) have been in active continuous practice not less than ten years; and (2) have completed either course, A., B. or C.; (3) can pass a satisfactory preliminary examination and furnish satisfactory evidence of original thought and research in the domain of dental science. At the end of the five years' course they become members of the Post-Graduate Dental Association, and must pass a rigid examination, practical, oral and written, before a Board of Examiners, upon whose unanimous recommendation the degree of Doctor of Oristry, will be conferred on the successful candidates.

DOCTORS AND DENTISTS IN GREAT BRITAIN.—The number of medical practitioners registered in 1891, according to the *Medical Review*, was 1,345, as against 1,266 in 1890. Deducting from these the removals from the register, owing to deaths and other causes, the total increase during the year was 392. The total names now on the register in the whole of Great Britain is 29,555, against 29,163 last year. Of the new registrations, 683 were effected in England, 502 in Scotland, and 160 in Ireland.

The dentists' register for 1892 contains 79 more persons than in 1891, thus making a total of 4,896, of which number 1,179 practitioners (24.07 per cent.) possess the qualification of Licentiate of Dental Surgery (L. D. S.) while 3,698 (75.55 per cent.) are registered as in practice before the passage of the registry law in 1878.

The number of foreign dentists now registered is 19, nearly 0.4 per cent. of the whole.

UNIVERSITY OF BUFFALO—DENTAL DEPARTMENT.

The new dental school in Buffalo starts off with a class larger than was expected. It has met with the same local opposition that all new schools have encountered, but which in this case was more than usually bitter and irrational. One would have thought that mere home-pride and common professional feeling would have prompted those who were inimical, to an attempt to make matters better instead of worse, but this has not been the case. The spite of some of those who could not have their own way has been vented in impotent efforts to prevent the matriculation of students, and to cripple an honest endeavor to make the best of a necessity which had arisen.

The bitterness and personal animosity shown have but stimulated the efforts of the promoters of the school, and made them the more determined to organize an institution that shall be a credit to dentistry. Considerable more money and labor have been expended than would have been under other circumstances. Thoroughly competent, and even eminent men, have been brought in from outside, who might not have been secured but for the opposition that has acted as a spur to exertion. The opposing element has made its disaffection so public, that this public statement should in justice be made.

The organization was effected by the men whom the University chose for that purpose, and they have tried very hard to prove faithful to the duty that was absolutely thrust upon them. They selected the men whom they thought best adapted and qualified for the positions. It was impossible for all to have places, and every dentist in Buffalo could not be put in a position to dictate the policy to be followed. When two men ride upon the same horse, one must of necessity ride behind. The men selected by the University have acted upon their best judgment, and their decision must be final. That is all there is of it. They sincerely regret any difference of opinion, and solemnly declare that the fault is not with them, for they have sought only peace. They have entire respect for honest differences of opinion, but by mere factional opposition and personal-spite work they are not in the least moved. The curriculum adopted and teachers called, speak for the school in language louder than mere words.

VALLEY TAN.

With the single exception of the American Indian, it is said there has never existed any people so low in intelligence that they have not devised some means of obtaining alcohol in sufficient strength to produce intoxication. Probably there is no product that is so universal among mankind. Even the inhabitants of the frozen North get alcohol by distilling the products of the arctic fir-trees. It is a singular fact that the American Indian, who never of himself obtained alcohol by any process of distillation, has the most ungovernable appetite for it. There never was a native Indian who would not get drunk if the opportunity offered.

The Mormons of Utah never allow the sale of alcohol among themselves, when they are masters of the situation. Yet their religion does not conquer their appetites, for they have an illicit form of it called Valley Tan, which is indigenous to Mormondom. It is said to have all the characteristics of a distillation from sage brush. It looks bitter, smells loud, and tastes yellow, but it gets there just the same.

For the Congress.—The Finance Committee of the World's Columbian Dental Congress, consisting of Drs. L. D. Shepard, T. W. Brophy, and A. L. Northrop, have placed the amount necessary to be contributed by the dentists of America in advance of the meeting, at $30,000.

EXAMINING BOARDS.

The Committee of the American Dental Association, appointed to consider the suggestions made in the President's address, practically declared that it was impossible to secure appointments to positions on the State Examining Boards, uninfluenced by political considerations, unless some Society which should embrace eighty or ninety per cent. of the reputable dentists, should make a unanimous demand for certain appointments.

Of course no Society contains anywhere near that proportion, so the Committee really reported that Examining Boards must continue to have a political origin.

In the State of New York, there has never been any complaint of political interference,, and the Board has represented the dentists of the State and not the political managers. The members are elected by the State Dental Society, as they should be, and are responsible to that body, and not to the politicians. During the existence of the Board — about twenty-five years — there has seldom been a change that was not made necessary by death, and some of the present members have served ever since the passage of the law. There has never been a single complaint against any action ever taken by it.

THE FACULTY OF THE BUFFALO DENTAL SCHOOL.

LECTURING STAFF.

DR. H. A. BIRDSALL, Professor of Dental Materia Medica and Therapeutics.
DR. F. E. HOWARD, Professor of Operative Dentistry.
DR. J. EDW. LINE, Professor of Dental Anatomy and Histology.
DR. C. A. ALLEN, Professor of Prosthetic Dentistry.
MR. W. H. MOSHER, Lecturer on Dental Chemistry and Metallurgy.

SPECIAL DEPARTMENTS.

DR. C. E. FRANCIS, Professor of Operative Dentistry for Children.
DR. C. F. W. BÖDECKER, Professor of Dental Embryology.
DR. F. B. DARBY, Professor of Orthodontia and Dental Deformities.

CLINICAL STAFF.

DR. A. P. SOUTHWICK, Clinical Professor of Operative Technics.
DR. GEORGE B. SNOW, Clinical Professor of Mechanical Technics.
DR. GEORGE J. FREY, Demonstrator of Operative Dentistry.
DR. H. B. MEADE, Demonstrator of Mechanical Dentistry.

UNIVERSITY STAFF.

PROF. ROSWELL PARK, Professor of Oral Surgery and Surgical Pathology.
PROF. W. C. BARRETT, Professor of Oral Pathology.
PROF. H. M. HILL, Professor of Chemistry.
PROF. JOHN PARMENTER, Professor of General Anatomy.
PROF. JULIUS POHLMAN, Professor of Physiology.
PROF. W. C. PHELPS, Professor of Regional Anatomy, and Demonstrator of Dissections.

ADJUNCT STAFF.

PROF. J. W. PUTNAM, Lecturer on Special Diseases of the Nervous System.
PROF. E. H. LONG, Lecturer on Special Therapeutics and Prescription Writing.
DR. A. L. BENEDICT, Lecturer on Special Diseases of the Digestive Organs.
TRACY C. BECKER, Lecturer on Dental Jurisprudence.
DR. F. J. THORNBURY, Demonstrator of Bacteriology.

BOARD OF CURATORS.

First District.—Dr. William Carr, New York.
Dr. A. L. Northrop, New York.
Second District.—Dr. William Jarvie, Brooklyn.
Dr. O. E. Hill, Brooklyn.
Third District.—Dr. E. C. Baxter, Albany.
Dr. C. K. Van Vleck, Hudson.
Fourth District.—Dr. W. H. Colgrove, Johnstown.
Fifth District.—Dr. S. B. Palmer, Syracuse.
Dr. A. N. Priest, Utica.
Sixth District.—Dr. A. M. Holmes, Morrisville.
Dr. E. D. Downs, Owego.
Seventh District.—Dr. Frank French, Rochester.
Dr. F. H. Lee, Auburn.
Eighth District.—Dr. M. B. Straight (In place of A. P. Southwick, Censor,) Buffalo.
Dr. Byron Rathbun, Dunkirk.

The Board of Curators, which comprises the Examining Board of the Dental Society of the State of New York, will act as the Censors and Advisers of the Faculty during the term, and as the final Examining Board at its close. Beside the State Censor, who is a member *ex-officio*, one Curator is appointed from each of the Eight Dental Districts of the State.

DECLINED WITH THANKS.

A movement was inaugurated in England during the month of July, to induce the British Dental Association to hold its meeting for 1893 in Chicago. Cablegrams were sent to prominent American promoters of the Congress, asking their coöperation and authority to invite the Association to meet in America. It is needless to say that the proposition met with the heartiest approval in this country, but when the British meeting was held in Manchester, August 11th, it was declined with hearty thanks, and their next meeting will not be held in connection with the Columbian Congress.

Many of the members of the British Dental Association will, doubtless, attend the Chicago meeting, but what a memorable action it would have been, and how it might have drawn the profession of the two countries together, had the Association adjourned to meet in America. The members would have become better acquainted with American professional affairs, and we are sure that such knowledge would have been greatly to our advantage.

In Buffalo.—A goodly number of the members visited Buffalo at the close of the meeting at Niagara, and spent more or less time in the city. Among them were Drs. J. A. Swasey and F. H. Gardiner, of Chicago, with their wives, the latter being the guests of a Buffalo dentist during the meeting. Dr. J. Y. Crawford and family, of Nashville, Tenn., remained some days in the city, being charmed by what he pronounced the most beautiful summer city in America. Dr. W. H. Eames, of St. Louis, remained in the city for a few days. Drs. William Carr and C. F. W. Bödecker, of New York, were the guests of Buffalo dentists, returning to their country places on Long Island after a brief visit here. Dr. W. W. Allport and E. D. Swain, of Chicago, also visited Buffalo. During all the heated term of the week preceding the meeting at Niagara, the highest point that the thermometer touched in Buffalo was 84 degrees.

THE RATE OF INCREASE.

Linnæus said that three flies would consume a dead horse quicker than a lion, and he was undoubtedly correct. The fly produces 20,000 larvæ daily, and as each of these comes into the world all ready for business, it may readily be seen with what rapidity they can multiply.

It has been estimated that if everything were favorable,—if all the waters on the globe were composed of the proper culture media and none were destroyed—the product of a single bacterium cell might, in three days, fill all the oceans to their nethermost depths, so almost infinite is their rate of proliferation. And yet in size they may compare with man as the latter does with Mont Blanc.

SOUTHERN DENTAL SOCIETY.—The annual meeting of this Society was held at Lookout Mountain, Tenn., the week preceding that of the A. D. A. It was a successful meeting, a large number from the Northern States being present. The heat was something terrific according to their accounts, and a number showed the effects of it, but this was the only thing to mar the enjoyment of the occasion.

The following were elected officers for the ensuing year:

President, B. HOLLY SMITH, Baltimore, Md.
1st Vice-President, R. K. LUCKIE, Holly Springs, Miss.
2d Vice-President, S. B. COOK, Chattanooga, Tenn.
3d Vice-President, L. P. DOTTERER, Charleston, S. C.
Corresponding Secretary, D. R. STUBBLEFIELD, Nashville, Tenn.
Recording Secretary, S. W. FOSTER, Decatur, Ala.
Treasurer, H. E. BEACH, Clarksville, Tenn.
Executive Com. { GORDON WHITE, Nashville, Tenn.
W. R. CLIFTON, Waco, Texas.

AMERICAN DENTAL ASSOCIATION.—The following were elected as officers for the coming year:

President, J. D. PATTERSON, Kansas City, Mo.
1st Vice-President, J. Y. CRAWFORD, Nashville, Tenn.
2d Vice-President, S. C. G. WATKINS, Montclair, N. J.
Corresponding Secretary, FRED. LEVY, Orange, N. J.
Recording Secretary, GEO. H. CUSHING, Chicago, Ill.
Treasurer, A. H. FULLER, St. Louis, Mo.
Executive Com. { W. W. WALKER, New York, N. Y.
S. G. PERRY, New York, N. Y.
D. N. MCQUILLEN, Philadelphia, Pa.

AT NIAGARA.—The greater number of the delegates to the A. D. A. stopped at the Cataract House. It is not probable that so many would go there again. The rates in some instances were extortionate, the rooms are dilapidated and the whole house out of repair, while that which was its greatest charm, the river parlors, has been torn away. "Ichabod" might with propriety be inscribed upon its walls, for its former glory has departed. To add to the whole, a large number of those stopping in the house were seized by illness. Whether it was the water or the food, stomach and bowel troubles seemed rather the rule. We heard no such complaints from those who stopped at "The International."

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

This body, which is composed of delegates from the Boards of States whose law provides for their appointment, met at Niagara the day preceding the meeting of the American Dental Association. Eighteen States and Territories were represented.

There was no very important legislation. Complaint was made that the examination and passing certificates of the colleges were such formidable looking documents that they had, in some instances, been used to lead the people to believe that they were veritable diplomas. The National Association of Dental Faculties agreed to simplify them.

A resolution providing that when a member of a State Board represented in the Association becomes a teacher in any college, his resignation from his Board should follow, was adopted.

The Committee on Colleges reported that the actual number of students in attendance during the last session in the schools recognized by the Examiners' Association, was 2,881; graduates, 1,357. In the schools not so recognized, the students were 236, and graduates 96.

The Association memorialized the National Association of Dental Faculties, asking that a higher grade of preliminary education for students be demanded, and that a laboratory technique in histology, pathology, dental surgery and dental prosthesis be made a requirement of the schools.

The following were elected officers for the ensuing year:

President, W. E. Magill, Erie, Pa.
Vice-President, J. Y. Crawford, Nashville, Tenn.
Secretary and Treasurer, Fred. Levy, Orange, N. J.

APROPOS TO ———

The following is extracted from a private letter, written by one whose honored age and wide ascendency, secured by the converse of the qualities described, serve to emphasize his words:

> "The influence of selfish, narrow-minded individuals is exceedingly limited, and of short duration. Sensible and thinking men are not much affected by their braying. Like a six-penny bunch of Chinese fire-crackers — for the instant a disagreeable small racket, a puff of smoke and a smell of brimstone, which the first fresh current of healthful air wafts into oblivion."

The Sections of the A. D. A.—If there was one Section that held a meeting for the preliminary discussion and careful examination of papers, we do not know which one it was. We saw officers scurrying about the hall to get enough members together to form an organization, and not always with success. One of the largest of the Sections was able to secure the attendance of just three persons, the Chairman, the Secretary and one other. It is needless to say that the old officers were unanimously re-elected. There is no excuse for the continuance of the Section organizations, and the cumbrous, useless machinery should be relegated to the lumber room.

A Practice in Europe.—A rare opportunity is offered to the right man, as assistant to a famous American dentist in one of the first cities of Europe, but the applicant must be a first-class dentist — not merely a dental mechanic or tooth-filler — and he must have had from three to five years experience. He must be able to take the whole burthen of a large practice on his hands, with the prospect, in all probability, of succeeding, in a few years, to a business worth $20,000 per annum.

A CORRECTION.

It is hard enough to secure grammatical accuracy in English composition when it appears in print. How much more so in another tongue. In the formula presented by Dr. Miller, on page 126 of the last number of this Journal, some errors very annoying to the scholarly writer or reader occur. The first ingredient appears in good Latin, while the second has the English form, and the third, which is the excipient, is separated from the directions which should accompany it. All this was easy enough by the misreading of a single letter, and the substitution of a capital for a lower-case character by the proof-reader. Here is the prescription as it should read:

℞ — Acidi arsenicosi
Cocaini hydrochlorat. $\bar{aa}$ 0,5
Acidi carbolici q. s.,
ut fiat pasta mollis.

NEW DENTAL JOURNALS.

Two new dental periodicals have lately been added to the list of those published. *The Dental Journal*, is published by the Dental Society of the University of Michigan, and is edited by under-graduates of that institution. It will be published bi-monthly through the College year, the first number appearing in December and the last in June, according to its announcement. The first two numbers present a very creditable appearance, and have evidently received careful editorial attention. The leading article is a historical sketch of the Dental Department of the University of Michigan, by Prof. Taft.

The other journal is called the *Revue Internationale*, and is published in Paris, the editor being our friend, M. Paul Dubois, formerly editor of *L' Odontologie*, and President of the Societe d'Odontologie of Paris. He has as collaborators a number of his associates in the School of Dentistry of Paris, and there is no doubt that the new journal will take a high position, for all who know M. Dubois are aware that his energy and capacity are limitless.

APHORISMS.

No man is well educated until he has been thoroughly taught by his mistakes.

There is nothing known that was not discovered through some man's suffering.

We are not benefited by the man who stands behind us. It is he who withstands us, and meets us face to face, from whom we gather strength.

THIS IS HIS YEAR.—Dr. J. D. Patterson, of Kansas City, has honors without limitation piled upon him. At the last meeting of the Missouri State Dental Society, held in July, he was elected its President. At the meeting of the National Association of Dental Faculties, in August, he was elected President of that body, and finally, he was elected President of the American Dental Association. Most men consider it sufficient glory for one year to be at the head of one such body, but Dr. Patterson is President of nearly everything in sight.

OFF FOR EUROPE.—Dr. W. W. Walker, the President of the American Dental Association, sailed for Europe immediately after the close of the meeting. His intention was to look after the interests of the Columbia Dental Congress while there. Dr. Walker made an excellent presiding officer, allowing no time to be wasted.

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